

Practitioner's Docket No. 65705-0002

410 Rec'd PCT/PTO 15 MAR 2000  
09/508794

CHAPTER II

**TRANSMITTAL LETTER  
TO THE UNITED STATES ELECTED OFFICE (EO/US)**

**(ENTRY INTO U.S. NATIONAL PHASE UNDER CHAPTER II)**

PCT/EP98/06008 ✓ 21/Sept./1998 ✓ 19/Sept./1997 ✓  
INTERNATIONAL APPLICATION NO. INTERNATIONAL FILING DATE PRIORITY DATE CLAIMED

Digital Book ✓  
TITLE OF INVENTION

Glenn Rolus Borgward ✓  
APPLICANT(S)

**Box PCT**  
**Assistant Commissioner for Patents**  
**Washington D.C. 20231**  
**ATTENTION: EO/US**

*NOTE: To avoid abandonment of the application, the applicant shall furnish to the USPTO, not later than 20 months from the priority date: (1) a copy of the international application, unless it has been previously communicated by the International Bureau or unless it was originally filed in the USPTO; and (2) the basic national fee (see 37 C.F.R. § 1.492(a)). The 30-month time limit may not be extended. 37 C.F.R. § 1.495*

**WARNING:** Where the items are those which can be submitted to complete the entry of the international application into the

**CERTIFICATION UNDER 37 C.F.R. 1.10\***  
(Express Mail label number is **mandatory**.)  
(Express Mail certification is optional.)

I hereby certify that this correspondence and the documents referred to as attached therein are being deposited with the United States Postal Service on this date 03/15/2000 ✓, in an envelope as "Express Mail Post Office to Addressee," Mailing Label Number EL323241970US, addressed to the: Assistant Commissioner for Patents, Washington, D.C. 20231.

Joyce Krumpe  
(type or print name of person mailing paper)

Joyce Krumpe  
Signature of person mailing paper

**WARNING:** Certificate of mailing (first class) or facsimile transmission procedures of 37 C.F.R. 1.8 cannot be used to obtain a date of mailing or transmission for this correspondence.

**\*WARNING:** Each paper or fee filed by "Express Mail" **must** have the number of the "Express Mail" mailing label placed thereon prior to mailing. 37 C.F.R. 1.10(b).  
"Since the filing of correspondence under § 1.10 without the Express Mail mailing label thereon is an oversight that can be avoided by the exercise of reasonable care, requests for waiver of this requirement will **not** be granted on petition." Notice of Oct. 24, 1996, 60 Fed. Reg. 56,439, at 56,442.

[illegible]

1. Applicant herewith submits to the United States Elected Office (EO/US) the following items under 35 U.S.C. 371:

- (Transmittal Letter to the United States Elected Office (EO/US)—page 2 of 8)

2.Fees

CLAIMS FEE	(1) FOR	(2) NUMBER FILED	(3) NUMBER EXTRA	(4) RATE	(5) CALCULATIONS
[ ]*	TOTAL CLAIMS	29- 20 =	9	x \$ 18.00 =	\$162.00
	INDEPENDENT CLAIMS	3- 3 =	0	x \$ 78.00 =	
	MULTIPLE DEPENDENT CLAIM(S) (if applicable) + \$260.00				
BASIC FEE**	<p>[ ] U.S. PTO WAS INTERNATIONAL PRELIMINARY EXAMINATION AUTHORITY Where an International preliminary examination fee as set forth in § 1.482 has been paid on the international application to the U.S. PTO:</p> <p>[ ] and the international preliminary examination report states that the criteria of novelty, inventive step (non-obviousness) and industrial activity, as defined in PCT Article 33(2) to (4) have been satisfied for all the claims presented in the application entering the national stage (37 CFR 1.492(a)(4)) ..... \$96.00</p> <p>[ ] and the above requirements are not met (37 CFR 1.492(a)(1)) ..... \$670.00</p> <p>[X] U.S. PTO WAS NOT INTERNATIONAL PRELIMINARY EXAMINATION AUTHORITY Where no international preliminary examination fee as set forth in § 1.482 has been paid to the U.S. PTO, and payment of an international search fee as set forth in § 1.445(a)(2) to the U.S. PTO:</p> <p>[ ] has been paid (37 CFR 1.492(a)(2)) ..... \$760.00</p> <p>[ ] has not been paid (37 CFR 1.492(a)(3)) ... \$970.00</p> <p>[X] where a search report on the international application has been prepared by the European Patent Office or the Japanese Patent Office (37 CFR 1.492(a)(5)) ..... \$840.00</p>				
	Total of above Calculations				= 1002.00
SMALL ENTITY	Reduction by ½ for filing by small entity, if applicable. Affidavit must be filed. (note 37 CFR 1.9, 1.27, 1.28)				-
	Subtotal				1002.00
	Total National Fee				\$ 1002.00
	Fee for recording the enclosed assignment document \$40.00 (37 CFR 1.21(h)). (See Item 13 below). See attached "ASSIGNMENT COVER SHEET".				
TOTAL	Total Fees enclosed				\$ 1002.00

\*See attached Preliminary Amendment Reducing the Number of Claims.

- i. ☐ A check in the amount of \_\_\_\_\_ to cover the above fees is enclosed.  
ii. ☒ Please charge Account No. 18-0013 in the amount of \$ 1002.00.  
A duplicate copy of this sheet is enclosed.

**\*\*WARNING:** "To avoid abandonment of the application the applicant shall furnish to the United States Patent and Trademark Office not later than the expiration of 30 months from the priority date: \* \* \* (2) the basic national fee (see § 1.492(a)). The 30-month time limit may not be extended." 37 C.F.R. § 1.495(b).

**WARNING:** If the translation of the international application and/or the oath or declaration have not been submitted by the applicant within thirty (30) months from the priority date, such requirements may be met within a time period set by the Office. 37 C.F.R. § 1.495(b)(2). The payment of the surcharge set forth in § 1.492(e) is required as a condition for accepting the oath or declaration later than thirty (30) months after the priority date. The payment of the processing fee set forth in § 1.492(f) is required for acceptance of an English translation later than thirty (30) months after the priority date. Failure to comply with these requirements will result in abandonment of the application. The provisions of § 1.136 apply to the period which is set. Notice of Jan. 3, 1993, 1147 O.G. 29 to 40.

3. ☒ A copy of the International application as filed (35 U.S.C. 371(c)(2)):

**NOTE:** Section 1.495 (b) was amended to require that the basic national fee and a copy of the international application must be filed with the Office by 30 months from the priority date to avoid abandonment "The International Bureau normally provides the copy of the international application to the Office in accordance with PCT Article 20. At the same time, the International Bureau notifies applicant of the communication to the Office. In accordance with PCT Rule 47.1, that notice shall be accepted by all designated offices as conclusive evidence that the communication has duly taken place. Thus, if the applicant desires to enter the national stage, the applicant normally need only check to be sure the notice from the International Bureau has been received and then pay the basic national fee by 30 months from the priority date." Notice of Jan. 7, 1993, 1147 O.G. 29 to 40, at 35-36 See item 14c below.

- a. ☐ is transmitted herewith.  
b. ☐ is not required, as the application was filed with the United States Receiving Office.  
c. ☒ has been transmitted  
i. ☒ by the International Bureau.  
Date of mailing of the application (from form PCT/IB/308): April 1, 1999  
ii. ☐ by applicant on \_\_\_\_\_.  
Date

A COPY OF WHICH  
IS ENCLOSED

4. ☒ A translation of the International application into the English language (35 U.S.C. 371(c)(2)):  
a. ☒ is transmitted herewith.  
b. ☐ is not required as the application was filed in English.  
c. ☐ was previously transmitted by applicant on \_\_\_\_\_.  
Date  
d. ☐ will follow.

5. ☐ Amendments to the claims of the International application under PCT Article 19 (35 U.S.C. 371(c)(3)):

NOTE: The Notice of January 7, 1993 points out that 37 C.F.R. § 1.495(a) was amended to clarify the existing and continuing practice that PCT Article 19 amendments must be submitted by 30 months from the priority date and this deadline may not be extended. The Notice further advises that: "The failure to do so will not result in loss of the subject matter of the PCT Article 19 amendments. Applicant may submit that subject matter in a preliminary amendment filed under section 1.121. In many cases, filing an amendment under section 1.121 is preferable since grammatical or idiomatic errors may be corrected." 1147 O.G. 29-40, at 36.

- a. ☐ are transmitted herewith.
- b. ☐ have been transmitted
- i. ☐ by the International Bureau.  
Date of mailing of the amendment (from form PCT/IB/308): \_\_\_\_\_.
- ii. ☐ by applicant on \_\_\_\_\_.  
Date
- c. ☐ have not been transmitted as
- i. ☐ applicant chose not to make amendments under PCT Article 19.  
Date of mailing of Search Report (from form PCT/ISA/210): \_\_\_\_\_.
- ii. ☐ the time limit for the submission of amendments has not yet expired.  
The amendments or a statement that amendments have not been made  
will be transmitted before the expiration of the time limit under PCT  
Rule 46.1.
6. ☐ A translation of the amendments to the claims under PCT Article 19 (38 U.S.C. 371(c)(3)):
- a. ☐ is transmitted herewith.
- b. ☐ is not required as the amendments were made in the English language.
- c. ☐ has not been transmitted for reasons indicated at point 5(c) above.
7. ☒ A copy of the international examination report (PCT/IPEA/409)
- ☒ is transmitted herewith.
- ☐ is not required as the application was filed with the United States Receiving Office.
8. ☒ Annex(es) to the international preliminary examination report
- a. ☒ is/are transmitted herewith.
- b. ☐ is/are not required as the application was filed with the United States Receiving Office.
9. ☐ A translation of the annexes to the international preliminary examination report
- a. ☐ is transmitted herewith.
- b. ☐ is not required as the annexes are in the English language.
10. ☒ An oath or declaration of the inventor (35 U.S.C. 371(c)(4)) complying with 35 U.S.C. 115
- a. ☐ was previously submitted by applicant on \_\_\_\_\_.  
Date
- b. ☐ is submitted herewith, and such oath or declaration
- i. ☐ is attached to the application.
- ii. ☐ identifies the application and any amendments under PCT Article 19 that  
were transmitted as stated in points 3(b) or 3(c) and 5(b); and states that

- iii. ☒ they were reviewed by the inventor as required by 37 C.F.R. 1.70.  
☐ will follow.

Other document(s) or information included:

11. ☒ An International Search Report (PCT/ISA/210) or Declaration under PCT Article 17(2)(a):

- a. ☒ is transmitted herewith.  
b. ☐ has been transmitted by the International Bureau.  
Date of mailing (from form PCT/IB/308): \_\_\_\_\_  
c. ☐ is not required, as the application was searched by the United States International Searching Authority.  
d. ☐ will be transmitted promptly upon request.  
e. ☐ has been submitted by applicant on \_\_\_\_\_.  
Date

12. ☒ An Information Disclosure Statement under 37 C.F.R. 1.97 and 1.98:

- a. ☐ is transmitted herewith.  
Also transmitted herewith is/are:  
☐ Form PTO-1449 (PTO/SB/08A and 08B).  
☐ Copies of citations listed.  
b. ☒ will be transmitted within THREE MONTHS of the date of submission of requirements under 35 U.S.C. 371(c).  
c. ☐ was previously submitted by applicant on \_\_\_\_\_.  
Date

13. ☐ An assignment document is transmitted herewith for recording.

A separate ☐ "COVER SHEET FOR ASSIGNMENT (DOCUMENT) ACCOMPANYING NEW PATENT APPLICATION" or ☐ FORM PTO 1595 is also attached.

\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

14. ☒ Additional documents:

- a. ☐ Copy of request (PCT/RO/101)  
b. ☒ International Publication No. WO 99/15982  
i. ☐ Specification, claims and drawing  
ii. ☒ Front page only  
c. ☒ Preliminary amendment (37 C.F.R. § 1.121)  
d. ☐ Other

\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

15. ☒ The above checked items are being transmitted  
a. ☒ before 30 months from any claimed priority date.  
b. ☐ after 30 months.
16. ☐ Certain requirements under 35 U.S.C. 371 were previously submitted by the applicant on \_\_\_\_\_, namely:  
\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

### AUTHORIZATION TO CHARGE ADDITIONAL FEES

**WARNING:** Accurately count claims, especially multiple dependent claims, to avoid unexpected high charges if extra claims are authorized.

**NOTE:** "A written request may be submitted in an application that is an authorization to treat any concurrent or future reply, requiring a petition for an extension of time under this paragraph for its timely submission, as incorporating a petition for extension of time for the appropriate length of time. An authorization to charge all required fees, fees under § 1.17, or all required extension of time fees will be treated as a constructive petition for an extension of time in any concurrent or future reply requiring a petition for an extension of time under this paragraph for its timely submission. Submission of the fee set forth in § 1.17(a) will also be treated as a constructive petition for an extension of time in any concurrent reply requiring a petition for an extension of time under this paragraph for its timely submission." 37 C.F.R. § 1.136(a)(3).

**NOTE:** "Amounts of twenty-five dollars or less will not be returned unless specifically requested within a reasonable time, nor will the payer be notified of such amounts; amounts over twenty-five dollars may be returned by check or, if requested, by credit to a deposit account." 37 C.F.R. § 1.26(a).

☒ The Commissioner is hereby authorized to charge the following additional fees that may be required by this paper and during the entire pendency of this application to Account No. 18-0013.

☒ 37 C.F.R. 1.492(a)(1), (2), (3), and (4) (filing fees)

**WARNING:** Because failure to pay the national fee within 30 months without extension (37 C.F.R. § 1.495(b)(2)) results in abandonment of the application, it would be best to always check the above box.

☒ 37 C.F.R. 1.492(b), (c) and (d) (presentation of extra claims)

**NOTE:** Because additional fees for excess or multiple dependent claims not paid on filing or on later presentation must only be paid or these claims cancelled by amendment prior to the expiration of the time period set for response by the PTO in any notice of fee deficiency (37 C.F.R. § 1.492(d)), it might be best not to authorize the PTO to charge additional claim fees, except possible when dealing with amendments after final action.

☒ 37 C.F.R. 1.17 (application processing fees)

☒ 37 C.F.R. 1.17(a)(1)-(5)(extension fees pursuant to § 1.136(a).

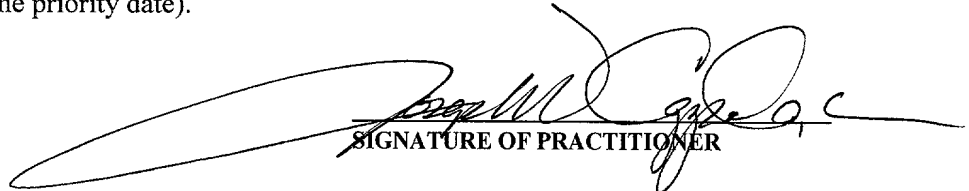
☐ 37 C.F.R. 1.18 (issue fee at or before mailing of Notice of Allowance, pursuant to 37 C.F.R. 1.311(b))

**NOTE:** Where an authorization to charge the issue fee to a deposit account has been filed before the mailing of a Notice of

Allowance, the issue fee will be automatically charged to the deposit account at the time of mailing the notice of allowance. 37 C.F.R. § 1.311(b).

NOTE: 37 C.F.R. 1.28(b) requires "Notification of any change in loss of entitlement to small entity status must be filed in the application . . . prior to paying, or at the time of paying . . . issue fee." From the wording of 37 C.F.R. § 1.28(b): (a) notification of change of status must be made even if the fee is paid as "other than a small entity" and (b) no notification is required if the change is to another small entity.

[X] 37 C.F.R. § 1.492(e) and (f) (surcharge fees for filing the declaration and/or filing an English translation of an International Application later than 30 months after the priority date).



SIGNATURE OF PRACTITIONER

Reg. No.: 33,373

Joseph V. Coppola, Sr.  
(type or print name of practitioner)

Tel. No.: (248) 594-0650

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**VERIFIED STATEMENT (DECLARATION) CLAIMING SMALL ENTITY  
STATUS (37 C.F.R. 1.9(f) AND 1.27(b)) - INDEPENDENT INVENTOR****Docket No.**  
**65705-0002**APPLICANT OR PATENTEE: **GLENN ROLUS BORGWARD**APPLICATION OR PATENT NO.: **09/508,794**FILED OR ISSUED: **3/15/2000**TITLE: **DIGITAL BOOK**

As a below named inventor, I hereby declare that I qualify as an independent inventor as defined in 37 C.F.R. 1.9(c) for purposes of paying reduced fees to the Patent and Trademark Office described in

- ☒ the specification to be filed herewith the title as listed above.  
 the application listed above.  
☐ the patent identified above.

I have not assigned, granted, conveyed, or licensed, and am under no obligation under contract or law to assign, grant, convey, or license, any rights in the invention to any person who would not qualify as an independent inventor under 37 C.F.R. 1.9(c) if that person had made the invention, or to any concern which would not qualify as a small business concern under 37 C.F.R. 1.9(d) or a nonprofit organization under 37 C.F.R. 1.9(e).

Each person, concern or organization to which I have assigned, granted, conveyed, or licensed or am under an obligation under contract or law to assign, grant, convey, or license any rights in the invention is listed below:

- ☒ No such person, concern or organization exists.  
☐ Each such person, concern or organization is listed below.

Separate verified statements are required from each named person, concern or organization having rights to the invention averring to their status as small entities (37 C.F.R. 1.27).

I acknowledge the duty to file, in this application or patent, notification of any change in status resulting in loss of entitlement to small entity status prior to paying, or at the time of paying, the earliest of the issue fee or any maintenance fee due after the date on which status as a small entity is no longer appropriate (37 C.F.R. 1.28(b)).

I hereby declare that all statements made herein of my own knowledge are true and that all statements made on information and belief are believed to be true; and further that these statements were made with the knowledge that willful false statements and the like so made are punishable by fine or imprisonment, or both, under Section 1001 of Title 18 of the United States Code, and that such willful false statements may jeopardize the validity of the application, any patent issuing thereon, or any patent to which this verified statement is directed.

NAME OF INVENTOR: **GLENN ROLUS BORGWARD, Whistlerweg 16, D-81470 München Germany**

SIGNATURE OF INVENTOR

DATE: **29 03 00**

65705-002

422 Rec'd PCT/PTO 15 MAR 2000  
09/508794

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In re application of: Glenn Rolus Borgward

Int'l Application: PCT/EP98/06008

Int'l Filing Date: Sept. 21, 1998

Serial No.:

Group Art Unit:

Filed: Herewith

Examiner:

For: Digital Book

Attorney Docket No.: 65705-002

Paper No.

Box PCT  
Assistant Commissioner of Patents  
Washington, D.C. 20231  
Attn: EO/US

**PRELIMINARY AMENDMENT**

Dear Sir:

Please amend the application as follows prior to examination on the merits.

**IN THE CLAIMS**

Please cancel claims 1-29 and add the following new claims.

30. (New) A digital book, in particular for reproducing text and image information, comprising
- a) a casing having a sheet-like display unit and at least one flat screen and
  - b) at least one input means for triggering associated operating functions;
  - c) with reading matter being represented in the sheet-like display unit and

- d) for at least one triggerable operating function, there being adapted to be set an associated, operating-function specific mode of operation,
  - in which, in a first operating-function specific mode of operation, there is no operating-function associated symbol indicated in or beside the reading matter on the sheet-like display unit and
  - in a second operating-function specific mode of operation, there is an operating-function associated symbol indicated in or beside the reading matter on the sheet-like display unit.

31. (New) The digital book of claim 30, further including

- a) a manipulation region has provided therein at least two input means adapted to be actuated,
- b) the arrangement of the input means adapted to be actuated in the manipulation region is designed such that said input means can be actuated simultaneously with the fingers of a hand.

32. (New) The digital book of claim 31, wherein the process of operation is carried out by actions of the fingers of the user on the manipulation region, without this necessitating substantial shifting of the wrist of the user's hand relative to the casing.

33. (New) The digital book of claim 32, wherein the casing within the manipulation region has at least one input means adapted to be actuated, which is arranged laterally or on the side directed away from the flat screen.

34. (New) The digital book of claim 33, wherein the screen is designed a pressure-sensitive touchscreen at least in the manipulation region.

35. (New) The digital book of claim 34, wherein the screen is designed as pressure-sensitive touchscreen at least in the edge portion thereof, with at least a screen corner portion or a portion located in the middle of an edge section being operable to trigger specific functions.
36. (New) The digital book of claim 30, wherein the input means individually or in combination trigger
- leafing-through functions for navigating in the book contents displayed,
  - providing functions for selection menus or
  - selection functions within selection menus provided.
37. (New) The digital book of claim 36, wherein specific input means, individually or in combination, in the basic mode are associated with a specific first functionality, but immediately after triggering a providing function for a selection menu trigger, in a selection mode, a selection function within this selection menu provided.
38. (New) The digital book of claim 37, wherein the selection menus are indicated exclusively in an edge portion of the screen, without covering the book contents displayed.
39. (New) The digital book of claim 38, wherein the manipulation region comprises at least one multifunction key means.
40. (New) The digital book of claim 39, wherein the input means comprises at least one separate mechanical operating element.
41. (New) The digital book of claim 39, wherein the input means comprises at least one pressure-sensitive region of a touchscreen.

42. (New) The digital book of claim 39, wherein the input means comprises a voice control means including a microphone.
43. (New) The digital book of claim 30, wherein in the basic mode, operating information having no relation to selection menus is indicated in the sheet-like display unit.
44. (New) A mobile digital display means, in particular for reproducing text and image information, comprising:
- a) a casing having a sheet-like display unit with at least one flat screen,
  - b) at least one manipulation region for operation by a user, and
  - c) at least one operating element adapted to be actuated and located within the manipulation region on the side directed away from the flat screen or in a casing edge laterally adjacent the flat screen,
  - d) said operating elements, individually or in combination, triggering
    - leafing-through functions for navigating in the book contents displayed,
    - providing functions for selection menus or
    - selection functions within selection menus provided.
45. (New) The display means of claim 44, wherein
- a) the manipulation region has provided therein at least two operating elements adapted to be actuated,
  - b) the arrangement of the operating elements adapted to be actuated in the manipulation region is designed such that said operating elements can be actuated simultaneously with the fingers of a hand.
46. (New) The display means of claim 44, wherein the process of operation is carried out by actions of the fingers of the user on the manipulation region, without this necessitating substantial shifting of the wrist of the user's hand relative to the casing.

47. (New) A mobile digital display means, in particular for reproducing text and image information, comprising:

- a) a casing having a sheet-like display unit with at least one flat screen,
- b) at least one manipulation region for operating by a user, and
- c) at least two operating elements adapted to be actuated and located within the manipulation region outside of the range of the sheet-like display unit,
- d) said operating elements triggering at least pre-determined
  - leafing-through functions for navigating in the book contents displayed,
  - providing functions for selection menus or
  - selection functions within selection menus provided,
- e) when corresponding predetermined pairs of operating elements are actuated simultaneously or when corresponding predetermined pairs of operating elements are actually immediately in succession, or when a corresponding predetermined operating element is operated twice immediately in succession.

48. (New) The display means of claim 47, wherein

- a) the manipulation region has provided therein at least two operating elements adapted to be actuated, and
- b) the arrangement of the operating elements adapted to be actuated in the manipulation region is designed such that said operating elements can be actuated simultaneously with the fingers of a hand.

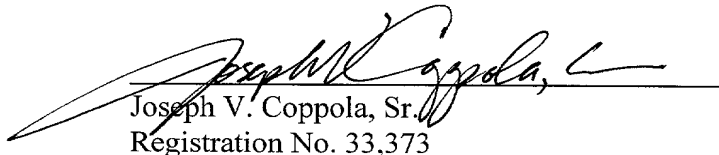
49. (New) The display means of claim 47, wherein the process of operation can be carried out by actions of the fingers of the user on the manipulation region, without this necessitating substantial shifting of the wrist of the user's hand relative to the casing.

50. (New) The display means of claim 49, wherein the casing within the manipulation region has at least one operating element adapted to be actuated, which is arranged laterally or on the side directed away from the flat screen.

51. (New) The display means of claim 50, wherein the screen is designed a pressure-sensitive touchscreen at least in the manipulation region.
52. (New) The display means of claim 51, wherein the screen is designed as pressure-sensitive touchscreen at least in the edge portion thereof, with at least a screen corner portion or a portion located in the middle of an edge section being operable to trigger specific functions.
53. (New) The display means of claim 52, wherein the selection menus are indicated exclusively in an edge portion of the screen, without covering the book contents displayed.
54. (New) The display means of claim 53, wherein the manipulation region comprises at least one multifunction key means.
55. (New) The display means of claim 53, wherein the manipulation region comprises three keys.
56. (New) The display means of claim 55, further including  
a voice control means including a microphone, wherein said voice control means takes over the function of at least one operating element.
57. (New) The display means of claim 56, wherein at least a portion of the screen is designed as a pressure-sensitive touchscreen that takes over the function of at least one operating element.

58. (New) The display means of claim 47, further including
- c) a coupling means for electric coupling of a data carrier unit,
  - d) means, connected with said coupling means, for automatically reading out data from the data carrier unit, and
  - e) means for determining, by using the data read out from the data carrier unit, both the reading matter displayed on the display unit and the operating functions available to the user.

Respectfully submitted,



Joseph V. Coppola, Sr.  
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(248) 594-0650  
Attorney for Applicants

CERTIFICATE OF MAILING

I hereby certify that the enclosed Preliminary Amendment is being deposited with the United States Postal Service on the date shown below with sufficient postage as Express Mail Post Office to Addressee mailing Label Number E2323241970US in an envelope addressed to the: Commissioner of Patents and Trademarks, Washington, D.C. 20231.

Date: 3-15-2000

By: Joyce A. Krumpke  
Joyce A. Krumpke



5

DIGITAL BOOK

10 The present invention relates to a digital book, in particular for the reproduction of book, newspaper and magazine information and other documentation and publications in electronic or digital form by means of text, graphical, photo and/or video and audio information for operation through laymen.

15 The consumption of paper and with it the demand for raw materials are growing year for year. The ever growing population and the always increasing demand for information, but also the self-imposed competition-induced communication constraint cause an explosion-like expanding  
20 flood of information which necessitates in always shorter intervals an immense consumption of paper, which thus is not only a burden to the environment but also entails an economic disadvantage as regards the transportation, stock-keeping and recycling costs as well the speed necessary to make available publications. Owing to modern  
25 information technologies it has indeed become possible to produce a large part of the information via computers, to offer it for instance via internet, online services or data bases or to market it in the form of CDs, however such information can be consumed by the consumer  
30 via PCs, laptops and notebooks only, which presupposes that at least one of the above-mentioned computers is purchased, that necessary applications are installed and that one has to be familiar with the use thereof before  
35 a first publication can be read.

The afore-mentioned reasons and the investment costs associated therewith, the necessary time and the, from

the view of a technical layman, special knowledge required for installing and operating hardware and software make it difficult for a large part of the population to take advantage of electronic publications. But also older or handicapped persons often do not find access to computers, since, without basic knowledge, operation and handling are not possible for a layman or possible with difficulties only, or the complexity of the user interfaces imposes excessive demands on these persons.

Moreover, laptops and notebooks, due to their various drives and multitude of input and output interfaces for specific applications, are of large volume and weight, and they are equipped with a keyboard for the entire particular font and with just one single screen or display. However, there are applications in which on the one hand the relatively costly and space-consuming keyboard is unnecessary and on the other hand the display or display/operating area provided by just one single screen is too small for specific applications.

Laptops and notebooks, due to their purpose as working tool and the constructionally necessitated or constructional features associated therewith, primarily are no ergonomic, i.e. handy and easy-operation means of information to take up, e.g. belletristic literature or for reading reports, articles, commentaries and news from magazines and newspapers or for studying publications in relaxed posture or in situations where no supporting surface is available. Expenditure and time of operation often stand in no relation to the often spontaneous demands which moreover are frequently to be settled shortly, e.g. looking up information from a lexicon, a telephone directory or a television magazine.

The document US 5,534,888 A1 reveals an electronic book comprising two display parts adapted to be folded open in the manner of a book, as well as a central part joining together these two display parts.

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A simple ergonomic and compact electronic device as actual substitute for books, magazines or newspapers for universal use in different situations in life, which is uncomplicated and comfortable to hold and operate for technical laymen and at the same time has little optical irritations for undisturbed reading and manipulating a large variety of different publications, is not known so far. The electronic book known from US 5,534,888, for handling through the user, requires often inconvenient and time-consuming complicated operations since a multitude of keys arranged in inconvenient manner in terms of ergonomics is to be operated, with the functionality thereof being predetermined and the space available for the display being thus curtailed. In case of an electronic book known from US 5,534,888 A1 the operation takes place with the aid of an auxiliary display on the outside of the book covers (display elements), with the result that the user must shut the electronic book in order to carry out specific adjustments. Furthermore, the keys can be operated in single manner only. On the reverse of the central part there is arranged a multitude of electrical connectors which are hidden behind protective flaps and which, if necessary, must be identified by the user with technical knowledge and must be made accessible by folding up the protective covers. In case electrical lines are connected to the electrical connectors, the electronic book of the prior art can no longer be held on the book back in the manner of a book or be placed on a support.

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It is thus the object of the invention to make available a digital book of the type indicated at the outset, which in contrast to the prior art offers, despite a compact construction, on the one hand a considerably enlarged display area and on the other hand handling options that are user-friendly, simple and easily understandable for computer laymen, to enable the same to read comprehensive literature, e.g. scientific works, encyclopedias or also belletristic literature, in order to offer the advantage to the user, also in comparison with a conventional more voluminous and heavier book, to at least read and/or possibly work on an arbitrary number of pages via e.g. just two digital book pages in handy form. The reading and viewing habits of traditional readers of books, magazines and newspapers need to be considered in this respect, who expects as irritation-free as possible viewing of the publications or document information indicated and are repelled by an impression too closely oriented along computer technology, e.g. as regards certain forms of operating elements or due to other overstrain, as it often occurs in case of older people or technical laymen who refuse to use an electronic or digital book. What is to be ensured in this respect is safe and ergonomic holding and operation in different situations, e.g. when walking, lying or if no other supporting surface is available, as well as simple and understandable handling with a minimum or lacking previous knowledge or for instance in case of a handicap. This is to provide uncomplicated and constant operability despite different possibilities of use and a multitude of tasks. It is intended to render possible fast and reduced operation with a minimum of changes in posture during reading.

The object underlying the invention is met by the subject matters of the independent patent claims.

Advantageous developments of the invention are defined by the features indicated in the dependent claims.

The digital book according to the present invention is advantageous since it represents a genuine alternative to a traditional book, presupposing first of all the viewing and reading habits of the user and requiring no specific technical (computer) knowledge. Furthermore, in comparison with the known prior art.

- a) the reading and/or working area is enlarged through operation by means of rear-side operating elements,
- b) pages can be read in the manner of traditional book pages, without disturbing elements, e.g. menu list, icons, operating elements etc.,
- c) this device can be used without specific preparations in any situation and in an arbitrary body position, e.g. in case of confinement to bed of the user.

Multifunction input means (Figs. 11/60h) located in the range of action of the holding hand, which can be combined (Figs. 13 to 19) and can be programmed or switched over under software control (Figs. 13 to 22) and preferably are formed as keys located on the side directed away from the display area and operated by means of the fingers of the holding hand (Figs. 3, 4, 5, 6, 11, 13 to 19), with functions being displayed only if required and being handled marginally without disturbing the document (Figs. 15a, 16 to 21):

- a) faster completion of operating routines

b) minimization of movement and avoiding constant changes in position of the hand holding the display means

5 c) reduction of the technical impression and/or expenditure with utmost utility with the least possible amount of input elements

10 d) better distribution of the tasks to the individual fingers

e) enlargement of the front display area

15 e) flexibility through the additional possibility of combination with other input means, such as e.g. the display area and/or actual operating elements which can also be operated with the other hand and/or voice input

20 f) easier orientation e.g. for visually impaired and blind persons (presupposed is of course the reading out of the book via an audio output)

25 User interface (Fig. 9) located on the underside of the digital book, preferably in the folding hinge of a two-part display unit (Figs. 1 to 6, 11), which is the holding grip of a one-part display unit (Fig. 12h), for coupling by means of cable connectors preferably with jack plugs, in order to effectively connect different devices, apparatus and means to the book (Figs. 1, 2, 3, 5, 30 11, 25, 26) and/or to serve as a support for the book station (Fig. 5) and to supply data information and/or energy to the digital book by means of signal transmission (Fig. 1):

35 a) uncomplicated connection

- b) avoiding damage in case of improper handling
  - c) reduction of interfaces and associated therewith  
reduced production costs
  - d) book back free from cables and plugs for better  
placement e.g. on a table surface or in the lap
  - e) use both for cable connection and for the holding  
pin of the supply station
  - f) more favorable symmetry and balance in case of pos-  
sibly arising strain loads through connected supply  
cables
  - g) lesser irritation through disturbing cables
  - h) reduction of the "technical impression" on the side  
of the user
- Ergonomically shaped display back side and flexibility
- a) handier, more pleasant and safer holding during op-  
eration and transport
  - b) more compact construction with sensible and optical-  
ly advantageous accommodation of the necessary elec-  
tronics
  - c) predetermined bending location for easier bending  
(flexibility)
  - d) protection of operating elements disposed on the  
rear side/laterally

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text side, without the current book page being covered or blanked out thereby. Besides, cross-references, reference hints etc. can be indicated by marking, e.g. by tapping the source mark with the screen pen, without  
5 requiring "page turning".

Due to the possibility of separating the screens of the digital book, it is possible, starting from a basic configuration thereof (which is intended for reading only),  
10 to match the secondary screen to the needs of the user in accordance with the requirement profile and the prior art, and the range of capabilities of the digital book can thus be expanded. For example, the secondary screen can be designed to be pressure-sensitive whereby a  
15 screen page can be written on in hand-writing by means of the screen pen while the written text quasi simultaneously can be indicated on the main screen in printed letters, and optionally in another language by means of a translation function of the loaded software. This renders possible e.g. more rapid and convenient preparation  
20 and revision of business letters.

A digital book having a first optimized user interface according to the invention, for simplified operation  
25 with minimum technical information, comprising at least one input unit located on a right and/or left side of the digital book for manipulating the information displayed and/or for effecting a change in operating state and/or setting and/or for loading document information  
30 and/or for switching to another operating mode, however without restriction thereto, with the main input element(s) or key element(s) being advantageously disposed in the gripping edge on the side (60h) of the digital book facing away from the display side, such that operations possibly may be carried out at a location where  
35

the display unit (10) is held, by means of the fingers of the holding hand.

Fig. 11 shows in exemplary manner an upper left position, preferably there is provided a position laterally in the middle of a display side, since the central position constitutes a more neutral starting position for operation, as will be pointed out in the subsequent description of the figures, in which however preferably three combinations keys, shown preferably in the exemplary figures, can be replaced by other operating elements, provided that these at least in part fulfil tasks by way of their properties, which include for example the selection and activation of information displayed on the display area and/or moving pages and/or at least the option of displaying a first item of information on the display area and/or to release an already displayed first item of information, e.g. by deactivation of an activation blocking means (ES) to be operated via an arbitrary input provided therefor, e.g. via touchscreen preferably also in the region of lateral gripping edge of the display (20). It is left open whether there is only service of real operating elements and/or in combination with a sensitive display area and/or in combination with speech, since this is dependent first of all (as shown in Figs. 16 to 19) on how the properties of the display medium are designed, e.g. as touchscreen or as a mere display screen. It is basically also possible to arrange other operating elements at other locations of the display unit without affecting the scope of protection.

The operating elements are provided in different designs and arrangements. The operating area may also be equipped e.g. with a slide pad and/or trackball and/or a

multifunction key etc. or the corresponding key areas can be designed as induction areas or switches.

5 A digital book with an additional optimized user inter-  
face according to the invention for simplified operation  
with minimum technical information, comprising at least  
one or plural display area(s) of sensitive design, via  
which, by touching an arbitrary, but predetermined loca-  
10 tion, first operating information of an invisible func-  
tional choice or operating information is made avail-  
able, i.e. displayed, which can be handled further. This  
takes place preferably by identification of a functional  
choice or functional group to be displayed via fixed  
position information (60'V) offered, for example, by a  
15 first corner of the display area and/or a central loca-  
tion on a lateral side of the display area. Preferably,  
it is provided for the normal reading mode to keep  
blanked out or invisible a multiplicity of irritating  
and disturbing functions or operating information to be  
20 indicated on the display area for operation and to make  
available corresponding functional or operating informa-  
tion only in case of necessity, with all functions being  
made visible or available either all at once or one  
functional group separately from at least one further  
25 functional group for manipulation thereof. The advantage  
hereof is an irritation-free or undisturbed document  
page displayed, similar to a book (illustrative examples  
are shown in Figs. 19, 20, 21).

30 An additional advantageous development, which however is  
not restricted thereby, effecting the installation of  
functional or operating information by an initialised  
document, provides the possibility of separating the  
display area into regions allowing the layman sensible  
35 operation with respect to specific functions of the pub-  
lication indicated, e.g. if a coupled memory with docu-

ment information (50') makes available all functions and operating information, respectively, required for service of this document, in the display unit in invisible manner at that location where the coupled memory is located. The layman thus has the possibility of requesting only that operating information that is directly associated with the initialized document.

A digital book comprising an additional optimized user interface according to the invention for simplified operation with minimum technical information, comprising at least a first solid-state coupling device (50) provided preferably in the upper part of the digital book and serving preferably for a memory card (50'), but being not restricted thereto, which by means of a coupling operation, preferably by insertion of the solid-state element, triggers one or several processes in the digital book, which facilitates handling of pages by a laymen insofar as e.g. the content of the coupled solid-state body, without further ado by the user, endeavors to carry out the task desired e.g. by introduction of the body (50') into the receiving opening designed for this purpose. For example, the contents of a memory card with book information is displayed after successful coupling, without additional activity by the user, or at least a first item of information is made available that only needs to be verified by the user (Fig. 24). The initialization request necessary therefor preferably is provided by the digital book, after identification of the coupled solid-state body. To this end, the already known plug and play technology may be used to ensure recognition of the solid-state body (cf. in this respect also Fig. 22 or Fig. 23).

An additional advantageous means for easy operation with minimum technical information according to the in-

vention, by coupling one or more solid-state bodies with the digital book according to the invention, consists in that these solid-state elements contain software and/or hardware components, such as e.g. electronic means (integrated circuits, battery, memory, transmitter and/or receiver for information transfer without cables, etc.) which in some way or other, as outlined, preferably without further ado of the user, expand the range of capabilities with regard to the information to be indicated, which is input into the digital book via the solid-state means, and/or takes over operating functions that cannot be carried out by the user, or in a restricted scope only, due to lack of an alphanumerical keyboard.

A further advantageous means for simple operation with a minimum of technical information, by coupling one or more solid-state bodies with the digital book according to the invention, is the automatic installation and/or setting of the digital book - effected by coupling of a solid-state memory with the digital book -, for example by programming the functional keys of the digital book for optimum handling of the document stored in the solid-state memory (Fig. 22) and the corresponding operating information and/or e.g. the automatic switching over from a separate-display operating mode to a combined-display operating mode, and vice versa, preferably automatically by coupling and/or decoupling a first and/or second solid-state memory with document information to be displayed (Fig. 23).

A digital book with an additional optimized user interface according to the invention for simplified operation with a minimum of technical information makes use of a coupling by means of cable connectors via preferably only one interface on the bottom side of the digital

book (70'), preferably in the pivot hinge of the book in case of two-part or multi-part display sections which in case of one-part display sections is the gripping handle, for receiving for example a jack plug (70'). This provides the advantage that the interface is sturdy, uncomplicated in operation and that the contact positions necessary for establishing contact can be accommodated along an arbitrary length of the jack plug, since introduction is not hindered by the constructionally necessitated depth of the digital book. The preferably only one interface is designed such that the electronic means of the digital book can be effectively connected to a large variety of different devices, means and apparatus by means of signals for transmitting data for example in bidirectional and serial fashion and/or energy. To this end, it is possible to couple different peripheral apparatus, such as e.g. printers and/or telephone and/or modem and/or PCs and/or laptops and/or charging devices, which are cited as examples only. For doing so, the layman user just needs to plug in the corresponding cable connector and latch the same, if there are provisions to this effect. Another function of this interface consists in receiving the guide and supply pin of the book station, which has the task of supplying energy and/or data information to the digital book, which for example in accordance with the particular design can be provided on the book station or in the digital book. This supply plug at the same time serves as a stabilization pin (Figs. 5/7) of the digital book to be arranged thereon in upright position, namely as two-part book in the closed state and/or as one-part book in the opened state via the interface integrated in the handle (not shown).

Embodiments of the invention will be described in detail in the following with reference to a number of drawing figures:

5 Fig. 1 shows a schematic plan view of a display-part coupling embodiment of the digital book according to the invention with two display parts in the folded open condition of the book casing along with schematically indicated installations and additional elements for the digital book, including the separating and coupling possibilities of the essential parts thereof.

10 Fig. 2 shows a simplified schematic plan view of the display-part coupling embodiment of the digital book according to the invention with two display parts in the folded open state of the book casing along with additional elements, similar to the representation shown in Fig. 1.

15 Fig. 3 shows a schematic side view of a permanently connected embodiment and/or of the main part of the display-part coupling embodiment of the digital book with two display parts, along with preferably juxtaposed combination key elements in the region of the gripping edge for operation thereof.

20 Fig. 4 shows, partly in section, a bottom view of the permanently connected embodiment and/or the display-part coupling embodiment of the closed digital book according to the invention with two display parts, for use of the preferably juxtaposed combination key elements in the region of the gripping edge for operation e.g. by a left-handed and/or right-handed person if e.g. a display area adapted to be written on is disposed on the right side of the digital book.

Fig. 5 shows a perspective view of the permanently connected and/or display-part coupling embodiment of the digital book according to the invention with two display parts in the closed condition for using the preferably juxtaposed combination key elements in the region of the gripping edge for operation, as well as a perspective view of a supply unit.

Fig. 6a, Fig. 6b and Fig. 6c show different perspective views, in the "folded-open" state, of a permanently connected and/or a display-part coupling embodiment of the digital book according to the invention, comprising two display parts, for reading and/or writing on a display area adapted to be written on.

Fig. 7a, Fig. 7b, Fig. 7c, Fig. 7d, Fig. 7e and Fig. 7f show different representations, constituting however no restriction, of the permanently connected and/or the display-part coupling embodiment of the digital book according to the invention with one, two and three display parts in various situations of use, from which various advantages of the digital book are apparent.

Fig. 8 shows a representation of a possible structure of the secondary part of a display-part coupling embodiment of the digital book according to the invention in the form of a double screen, similar to a folding map or a time organizer in the "folded open" state of the digital book for use with three screens.

Fig. 9a and Fig. 9b show representations of the same embodiment as shown in Fig. 8, in the folded together or "folded shut" state of the digital book.

Fig. 10 shows an exemplary block circuit diagram of the display-part coupling embodiment of the digital book



according to the invention in the form of a configuration of units and components for operation of the digital book, however without restriction to this block circuit diagram.

5

Fig. 11 shows a representation of the permanently connected and/or display-part coupling embodiment of the digital book according to the invention, however without restriction thereto, and of the optimized user interfaces underlying the invention for simple operation by a layman and for reducing technical information.

10

Fig. 12 shows a representation of different modes of appearance of the digital book according to the invention, however without restriction thereto, in the form of a one-part or multi-part, permanently connected or display-part coupling embodiment.

15

Fig. 13 shows the partial aspects underlying the digital book according to the invention, for optimizing, i.e. simplifying operation along with simultaneous reduction of irritating information and/or technical designs.

20

Fig. 14, by way of an example of a folded-open two-part digital book according to the invention, however without restriction thereto, shows the provision of operating information and the further handling thereof by means of operating elements located away from the display area and/or by means of an input via a sensitive input area, as well as the provision of first functional information as well as further operation via the sensitive input area.

25

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Fig. 15 shows the functional possibilities of a minimum configuration of operating elements of the digital book according to the invention, comprising a first function

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for carrying out a first task, using as example the provision of selection information on the display area and the automatic and software-controlled reprogramming of the operating elements following after first operation, for fulfilling a second task, e.g. selecting and/or activating a selected function, or deactivating of the provision.

Fig. 16 shows the general combination possibility of an input area of the digital book according to the invention, using as example three real operating elements and their programming with regard to a first function and additional first functions possible by combined operation, as well as the automatic software-controlled reprogramming of the operating elements through a first operating step, for fulfilling a second task in a second operating step.

Fig. 17, by way of the example of one-part and two-part display sections of the digital book according to the invention, shows the programming of the three operating elements for a digital book, which are preferably disposed on the rear side, in which operation is accomplished only via real operating elements.

Fig. 18, by way of the example of one-part and two-part display sections with an additional input possibility via the display area (touchscreen), shows the programming of the three operating elements for a digital book, which are preferably disposed on the rear side, in which the real operating elements in a first function realize the provision of operating information on the display area, for possible subsequent further processing or operation via a sensitive display area.

Fig. 19, by way of the example of one-part and two-part display sections, shows the programming of the three operating elements for a digital book, which are arranged preferably on the rear side, as rapid-function operating elements for frequent routine operations, using as example a first function of simple-operation operating elements, for example for moving the pages within a book document and processing of not so often needed functions via the display area, with these functions being made available by touching a location on the display area and being programmed for example by initialization of a coupled book document.

Fig. 20, by way of the example of a corner function and a function in the middle of a lateral edge displayed in the display area, shows an embodiment of Fig. 19, with lateral edge operations in the region of the gripping edge of the display unit being realized in a document edge and/or frame, in order not to irritate or disturb a displayed document.

Fig. 21, by way of the example of two corner functions displayed in the display area, shows an embodiment of Fig. 19, in which the lateral edge operations in the region of the gripping edge are realized in a document edge and/or frame in addition, in order not to irritate or disturb a displayed document.

Fig. 22, by way of the example of a one-part embodiment of the present invention, shows the automatic and software-controlled programming of operating elements and the resulting change in the displayed operating information by a coupled memory medium or an initialized document.

Fig. 23, by way of the example of a two-part embodiment of the present invention, shows the automatic switching over of a combined-display operating mode, during coupling of a second book document with the digital book, to a separate-display operating mode with corresponding display of the document on the display area as well as automatic switching over from a separate-display operating mode to a combined-display operating mode associated with a reverse process.

Fig. 24, by way of the example of a two-part embodiment of the digital book according to the invention, shows the activation and/or deactivation process of the digital book associated with coupling of a solid-state memory, as well as the attempt of installing and/or displaying the contents of the solid-state memory, which is effected automatically by coupling said solid-state element.

Fig. 25, by way of the example of a two-part embodiment of the digital book according to the invention, shows the coupling possibility of different external apparatus or means via a multifunction interface arranged at the bottom side of the digital book and designed as interface for cable connectors and/or of the supply station.

Fig. 26 shows in exemplary manner a hardware coupling and decoupling possibility by attaching or removing different hardware parts via the pivot hinge of a two-part digital book, which upon removing a part is the gripping handle of a one-part digital book, in which electronics is accommodated.

Fig. 26a, by way of the example of a one-part starting basis, shows the coupling of an exemplary gripping handle, as described in Fig. 26, or of a book cover of an

arbitrary material shown to be flexible in the example,  
or the coupling of a laptop keyboard.

5 Fig. 27 shows the ergonomic design of the present inven-  
tion along with the thus created compact construction  
and the improved holding and operating possibilities,  
both of a one-part and of a multi-part digital book.

10 Fig. 28 shows a flexible digital book according to the  
invention by way of the example of a display part, and  
the flexible design at least of the body or casing com-  
prising the display area, as an example of a pressure-  
sensitive design possibility e.g. by using an electron-  
ics-enclosing casing of foamed material.

15 Fig. 29 shows a flexible digital book according to the  
invention, by way of the example of a display part, and  
the flexible design of display area and casing, as an  
example of an at least partly flexible design possibili-  
20 ty by tightening e.g. a polymer display in a casing  
frame on two sides.

25 Fig. 30 shows several flexible digital books according  
to the invention by way of the example of one or two  
display parts with operating possibility, in which for  
example one or several polymer displays are adhered in  
at least partly transparent plastics or plastics-similar  
material for strengthening.

30 Fig. 1 shows a schematic plan view of a display-part  
coupling embodiment of the digital book according to the  
invention, comprising two display parts 1, 2, in the  
folded open condition of the book casing along with  
schematically indicated installations and additional  
35 elements EP, EP2, HP, NP2, 14, 5, 5', B for the digital  
book adapted to be coupled, including the separation and

connecting possibilities of the essential parts thereof.  
A casing of the two-part embodiment, adapted to be fold-  
ed open and shut in the manner of a book, comprises at  
least one folding axis A, a main part 1 and at least one  
5 secondary part 2, said parts 1, 2 forming together a  
book back part. Parts 1, 2 are combined so as to be me-  
chanically and/or electrically separable, with the nec-  
essary electrical connections of both parts 1, 2 being  
established for example by sliding contacts S, S'. Shown  
10 schematically are furthermore a main part circuit board  
HP, a secondary part circuit board NP as well as exten-  
sion circuit boards EP, EP2, which are interconnected  
via bus lines 14. Formed in the casing is an insertion  
channel 5 with a reading means, for insertion of a PC  
15 card 5' or the like, which in essence is used for load-  
ing the digital book and contains e.g. book texts,  
graphics, operating programs etc. The casing comprises  
furthermore an operating unit 6 with a plurality of op-  
erating elements, preferably individually or in combina-  
20 tion with operating keys (cp. e.g. Fig. 3).

Fig. 2: The display-part coupling embodiment of the dig-  
ital book according to the invention contains a display  
unit 1, 2, 3, 4 which is at least of two-part construc-  
25 tion and is arranged such that the main part 1 with at  
least one screen 3 and the secondary part 2 with at  
least one screen 4, in the folded-open state of the cas-  
ing, present themselves to the user, like pages of a  
book, for looking at and optionally, for working on as  
30 required (cp. also Fig. 2).

Fig. 3: The display part of the main part of the dis-  
play-part coupling embodiment of the digital book  
according to the invention, in the closed condition of  
35 the casing, is adapted to be plugged into a supply unit  
VE (cf. Fig. 5) via a guide and supply pin 7 having a

pair of power supply contacts 8 and a multiplicity of contact rings 9 for supplying and outputting information, said supply unit VE having a supply unit opening VE' for inputting and outputting information signals and/or for supplying energy and for accommodating the digital book (cp. Fig. 5). The book back part BR contains furthermore a light-emitting diode L for indicating the charging state of battery B. The juxtaposed combination key elements are arranged in the region of the gripping edge.

In a modified embodiment, main part and secondary part may also be fixedly or permanently connected to each other in pivotable manner, without the provision that both parts can be separated from each other.

Fig. 4 shows partly in section a bottom view of the main part of the permanently connected and/or of the display-part coupling embodiment of the closed digital book according to the invention for use e.g. by a left-hander and/or a right-hander if e.g. a display area adapted to be written on is disposed on the right side of the digital book, with the representation containing the elements described hereinbefore. The casing contains, in a guide and supply opening 7', countercontacts 8' for power supply and/or countercontacts 9' for inputting and outputting information. The book back part BR (cp. also Fig. 3) is provided with a preferably rechargeable battery B for power supply of the electronic units and components of the digital book and for driving the screens 3, 4.

Fig. 5 shows, as already indicated, a perspective view of the permanently connected and/or of the display-part coupling embodiment with two display parts of the digital book according to the invention in the closed state,

as well as a perspective view of a supply unit VE having a receiving opening VE'. The guide and supply pin projecting from the supply unit serves, among other things, for stabilization of the digital book in the supply unit. The digital book is shown in relation to the supply unit VE in a condition during removal of the digital book or in a condition during introduction of the same into the supply unit VE. Supply unit VE comprises a connecting cable 89 for inputting and/or outputting information, for example from and/or to a PC and/or a modem, and/or for supplying energy for powering the electronic units and components and for driving the screens of the digital book. Juxtaposed combination key elements are arranged in the region of the gripping edge.

Fig. 6a, Fig. 6b and Fig. 6c show different perspective views in the "folded open" condition a permanently connected and/or a display-part coupling embodiment of the digital book according to the invention with two display parts, for reading and/or e.g. writing on a display area adapted to be written on. Writing on the display area adapted to be written own and designed to be pressure-sensitive, in the example shown, takes place by means of a screen pen 15. Instead of using screen pen 15 for marking or triggering a specific function, it is of course also possible to press with a fingertip against a specific location of the screen, as it is known in connection with the so-called touchscreen.

Fig. 7a, Fig. 7b, Fig. 7c, Fig. 7d, Fig. 7e and Fig. 7f show, as already indicated, different representations of the permanently connected and/or of the display-part coupling embodiment with one, two and three display parts of the digital book according to the invention in different applications, these representations indicating various advantages of the digital book.



Fig. 8 shows the representation of a possible structure of a secondary part 2a, 2b in form a double screen 4a, 4b similar to a folding map or time organizer in the "folded open" condition of the digital book for an application with three screens 3, 4a, 4b. In the embodiment shown the casing of the digital book comprises two folding axes A1, A2.

Fig. 9a and Fig. 9b show representations of the same embodiment as shown in Fig. 8, in the folded together or "folded shut" condition of the digital book.

Fig. 10 shows, as already indicated, a block circuit diagram of the display-part coupling embodiment of the digital book according to the invention, showing the configuration of units and components for operating the digital book. In addition to the elements described hereinbefore, the block circuit diagram comprises a display unit D having two screens 3, 4, two screen drivers or graphic cards 3', 4', a control unit 10 with means for receiving, storing, processing and reproducing information, in which the information may be present in the form of text, image, graphical, audio and/or video information, an interface unit 11 for inputting and outputting information and for supply energy, said interface unit 11 including an information interface 12 and a power supply means 12 for supplying power to the units D, 10, 11 from the supply unit VE. Control unit 10 contains an EPROM, a ROM, a RAM, a CPU, a control means ST and a driver circuit TR, with these elements being interconnected via a bus line BL. The screen drivers or graphic cards 3', 4', the operating unit 6 with its operating elements, the control unit 10 and the information interface 12 are connected to each other via the afore-mentioned bus line 14.

Fig. 11 shows a representation of the permanently connected and/or of the display-part coupling embodiment with two display parts of the digital book according to the invention, and the optimized user interfaces for simple operation by a layman and for reducing technical information, with five individual

Fig. 11 shows a digital book according to the invention comprising an optimized user interface for simplified operation with a minimum of technical information, having at least one manipulation region 60h located on the right and/or left side of the digital book, in particular for manipulating the displayed information and/or for effecting a change in operating state and/or setting and/or for loading document information and/or for switching over to a different mode of operation, with the manipulation region 60h in this embodiment having functional keys F1, F2, F3 arranged on the rear side (i.e. the side directed away from the display area) as well as a pressure-sensitive input region 60t on the front side. Input region 60t optionally may also be realized by other technical means, e.g. capacitive proximity switches, miniature keys.

The manipulation region 60h is arranged such that manipulation operations should be possible at a location where the display unit 10 is held, by means of the fingers of the holding hand. Fig. 11 shows in exemplary manner an upper left position, and preferably there is provided a position in the middle of a lateral edge of a display side, since the middle position constitutes a more neutral starting position for operation, as will be pointed out in the subsequent description of the figures; there are provided preferably three combination keys.

at least in part fulfil tasks by way of their properties, which include for example the selection and activation of information displayed on the display area and/or moving pages and/or at least the option of displaying a first item of information on the display area and/or to release an already displayed first item of information, e.g. by deactivation of an activation blocking means (ES) to be actuated via an arbitrary input provided therefor, e.g. via touchscreen preferably also in the range of the lateral gripping edge of the display (20). It is left open whether there is only service of real operating elements and/or in combination with a sensitive display area and/or in combination with speech, since this is dependent first of all (as shown in Figs. 16 to 19) on how the properties of the display medium are designed, e.g. as touchscreen or as a mere display screen. It is basically also possible to arrange other operating elements at other locations of the display unit without affecting the scope of protection. The operating elements are provided in different designs and arrangements. The operating area may also be equipped e.g. with a slide pad and/or trackball and/or a multi-function key etc. or the corresponding key areas can be designed as induction areas or switches.

A digital book with an additional optimized user interface according to the invention for simplified operation with minimum technical information, comprising at least one or plural display area(s) of sensitive design, via which, by touching an arbitrary, but predetermined location, first operating information of an invisible functional choice or operating information is made available, i.e. displayed, which can be handled further. This takes place preferably by identification of a functional choice or functional group to be displayed via fixed position information (60'V) offered, for example, by a

first corner of the display area and/or a central location on a lateral side of the display area. Preferably, it is provided for the normal reading mode to keep blanked out or invisible a multiplicity of irritating and disturbing functions or operating information to be indicated on the display area for operation and to make available corresponding functional or operating information only in case of necessity, with all functions being made visible or available either all at once or one functional group separately from at least one further functional group for manipulation thereof. The advantage hereof is an irritation-free or undisturbed document page displayed, similar to a book (illustrative examples are shown in Figs. 19, 20, 21). An additional advantageous development, which however is not restricted thereby, effecting the installation of functional or operating information by an initialised document, provides the possibility of separating the display area into regions allowing the layman sensible operation with respect to specific functions of the publication indicated, e.g. if a coupled memory with document information (50') makes available all functions and operating information, respectively, required for service of this document, in the display unit in invisible manner at that location where the coupled memory is located. The layman thus has the possibility of requesting only that operating information that is directly associated with the initialized document.

A digital book comprising an additional optimized user interface according to the invention for simplified operation with minimum technical information, comprising at least a first solid-state coupling device (50) provided preferably in the upper part of the digital book and serving preferably for a memory card (50'), but being not restricted thereto, which by means of a coupling

operation, preferably by insertion of the solid-state element, triggers one or several processes in the digital book, which facilitates handling of pages by a laymen insofar as e.g. the content of the coupled solid-state body, without further ado by the user, endeavors to carry out the task desired e.g. by introduction of the body (50') into the receiving opening designed for this purpose. For example, the contents of a memory card with book information is displayed after successful coupling, without additional activity by the user, or at least a first item of information is made available that only needs to be verified by the user (Fig. 24). The initialization request necessary therefor preferably is provided by the digital book, after identification of the coupled solid-state body. To this end, the already known plug and play technology may be used to ensure recognition of the solid-state body (cf. in this respect also Fig. 22 or Fig. 23).

An additional advantageous means for easy operation with minimum technical information according to the invention, by coupling one or more solid-state bodies with the digital book according to the invention, consists in that these solid-state elements contain software and/or hardware components, such as e.g. electronic means (integrated circuits, battery, memory, transmitter and/or receiver for information transfer without cables, etc.) which in some way or other, as outlined, preferably without further ado of the user, expand the range of capabilities with regard to the information to be indicated, which is input into the digital book via the solid-state means, and/or takes over operating functions that cannot be carried out by the user, or in a restricted scope only, due to lack of an alphanumerical keyboard.

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A further advantageous means for simple operation with a minimum of technical information, by coupling one or more solid-state bodies with the digital book according to the invention, is the automatic installation and/or setting of the digital book - effected by coupling of a solid-state memory with the digital book -, for example by programming the functional keys of the digital book for optimum handling of the document stored in the solid-state memory (Fig. 22) and the corresponding operating information and/or e.g. the automatic switching over from a separate-display operating mode to a combined-display operating mode, and vice versa, preferably automatically by coupling and/or decoupling a first and/or second solid-state memory with document information to be displayed (Fig. 23).

A digital book with an additional optimized user interface according to the invention for simplified operation with a minimum of technical information makes use of a coupling by means of cable connectors via preferably only one interface on the bottom side of the digital book (70'), preferably in the pivot hinge of the book in case of two-part or multi-part display sections which in case of one-part display sections is the gripping handle, for receiving for example a jack plug (70'). This provides the advantage that the interface is sturdy, uncomplicated in operation and that the contact positions necessary for establishing contact can be accommodated along an arbitrary length of the jack plug, since introduction is not hindered by the constructionally necessitated depth of the digital book. The preferably only one interface is designed such that the electronic means of the digital book can be effectively connected to a large variety of different devices, means and apparatus by means of signals for transmitting data for example in bidirectional and serial fashion and/or

energy. To this end, it is possible to couple different peripheral apparatus, such as e.g. printers and/or telephone and/or modem and/or PCs and/or laptops and/or charging devices, which are cited as examples only. For doing so, the layman user just needs to plug in the corresponding cable connector and latch the same, if there are provisions to this effect. Another function of this interface consists in receiving the guide and supply pin of the book station, which has the task of supplying energy and/or data information to the digital book, which for example in accordance with the particular design can be provided on the book station or in the digital book. This supply plug at the same time serves as a stabilization pin (Figs. 5/7) of the digital book to be arranged thereon in upright position, namely as two-part book in the closed state and/or as one-part book in the opened state via the interface integrated in the handle (not shown).

A first optimized user interface for simple operation by a layman and for reducing irritating technical information, is at least one input unit located on a right and/or left side of the digital book for manipulating the information displayed and/or for effecting a change in operating state and/or setting and/or for loading document information and/or for switching to another mode of operation, however without being restricted thereto, with the main input element(s) or key element(s) being advantageously disposed in the gripping edge on the side (60h) of the digital book facing away from the display side, such that it should be possible to carry out operations at a location where the display unit (10) is held, by means of the fingers of the holding hand. In this respect, there is shown in exemplary manner an upper left position, and preferably there is provided a position laterally in the middle of a display

5 Just as little restrictive is the use of three combina-  
tions keys, shown as preferred number in the embodiment  
illustrated, however, these can be replaced by other  
operating elements, provided that these at least in part  
10 fulfil tasks by way of their properties, which include  
for example the selection and activation of information  
displayed on the display area and/or moving pages and/or  
at least the option of displaying a first item of infor-  
mation on the display area and/or to release an already  
15 displayed first item of information, e.g. by deactiva-  
tion of an activation blocking means (ES) to be operated  
via an arbitrary input provided therefor, e.g. via  
touchscreen preferably also in the region of the lateral  
gripping edge of the display (20). The embodiment shown  
leaves open whether there is only service of real oper-  
20 ating elements and/or in combination with a sensitive  
display area and/or in combination with speech, since  
this is dependent first of all on how the properties of  
the display medium are designed, e.g. as touchscreen or  
as a mere display screen. It is basically also possible  
25 to arrange other operating elements at other locations  
of the display unit without affecting the scope of pro-  
tection. The operating elements are provided in differ-  
ent designs and arrangements. For example, the operating  
area may also be equipped e.g. with a slide pad and/or a  
30 trackball and/or a multifunction key etc., or the corre-  
sponding key areas can be provided as induction areas or  
switches.

35       An additional optimized user interface for simple operation by a layman and for reducing irritating technical information, consists in one or plural display area(s)



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An additional optimized user interface for simple operation by a layman and for reducing irritating technical information, consists in at least a first solid-state coupling device (50) provided in the upper part of the digital book and serving preferably for a memory card (50'), but being not restricted thereto, which by means of a coupling operation, preferably by insertion of the solid-state element, triggers one or several processes in the digital book, which facilitates handling of pages by a laymen insofar as e.g. the content of the coupled solid-state body, without further ado by the user, endeavors to carry out the task desired e.g. by introduction of the element (50') into the receiving opening designed for this purpose.

For example, the contents of a memory card with book information is displayed after successful coupling, without additional activity by the user, or at least a first item of information is made available that only needs to be verified by the user (Fig. 24). The initialization request necessary therefor preferably is provided by the digital book, after identification of the coupled solid-state body. To this end, the already known plug and play technology may be used to ensure recognition of the solid-state body (cf. in this respect also Fig. 22 or Fig. 23).

An additional advantageous means for easy operation by coupling one or more solid-state elements with the digital book according to the invention, however without restriction thereto, consists in that these solid-state elements contain software and/or hardware components, such as e.g. electronic means (integrated circuits, battery, memory, transmitter and/or receiver for information transfer without cables, etc.) which in some way or other, as outlined, preferably without further ado of

the user, expand the range of capabilities with regard to the information to be indicated, which is input into the digital book via the solid-state means, and/or takes over operating functions that cannot be carried out by the user, or in a restricted scope only, due to lack of an alphanumerical keyboard. A further advantageous means for simple operation by coupling one or more solid-state bodies with the digital book according to the invention, however without restriction thereto, is the automatic installation and/or setting of the digital book - effected by coupling of a solid-state memory with the digital book -, for example by programming the functional keys of the digital book for optimum handling of the document stored in the solid-state memory (Fig. 22) and the corresponding operating information and/or e.g. the automatic switching over from a separate-display operating mode to a combined-display operating mode, and vice versa, preferably automatically by coupling and/or decoupling a first and/or second solid-state memory with document information to be displayed (Fig. 23).

An additional optimized user interface for easy operation by a layman and for reducing irritating technical information makes use of a coupling by means of cable connectors via preferably only one interface on the bottom side of the digital book (70'), preferably in the pivot hinge of the book in case of two-part or multi-part display sections which in case of one-part display sections is the gripping handle, for receiving for example a jack plug (70'). This provides the advantage that the interface is sturdy, uncomplicated in operation and that the contact positions necessary for establishing contact can be accommodated along an arbitrary length of the jack plug, since introduction is not hindered by the constructionally necessitated depth of the digital book. The preferably only one interface is designed such that

the electronic means of the digital book can be effectively connected to a large variety of different devices, means and apparatus by means of signals for transmitting data for example in bidirectional and serial fashion and/or energy. To this end, it is possible to couple different peripheral apparatus, such as e.g. printers and/or telephone and/or modem and/or PCs and/or laptops and/or charging devices, which are cited as examples only. For doing so, the layman user just needs to plug in the corresponding cable connector and latch the same, if there are provisions to this effect. Another function of this interface consists in receiving the guide and supply pin of the book station, which has the task of supplying energy and/or data information to the digital book, which for example in accordance with the particular design can be provided on the book station or in the digital book. This supply plug at the same time serves as a stabilization pin (Figs. 5/7) of the digital book to be arranged thereon in upright position, namely as two-part book in the closed state and/or as one-part book in the opened state via the interface integrated in the handle (not shown).

Fig. 12 shows a representation of different forms of appearance of the digital book according to the invention, however without restriction thereto, as one-part or multi-part, permanently connected or display-part coupling embodiment.

Fig. 13 shows the partial aspects underlying the digital book according to the invention for optimizing i.e. simplifying operation along with a simultaneous reduction of irritating information and/or technical designs by bundling the tasks and the corresponding input facilities concentrated in a portion.

There are shown two partial regions 1 and 2 representing the decisive aspects of the invention, which are related to each other, but also play a significant role separately from each other. On the basis of an embodiment, an opened digital book on the left side of Fig. 13, which shows the manipulation of displayed information by means of a cursor, the region 1 of Fig. 13 illustrates all partial aspects which together and/or separately from each other play a decisive role in simplifying operation of the digital book. This includes the reduction of the operating expenditure and the operating information via the possibility of operating section or key programming 60TPr of an initialized document Doc, which preferably is carried out automatically upon coupling of the information-carrying solid-state memory 50.

A further aspect 1b is the reduction of the operating expenditure and operating information by combination of input possibilities, such as e.g. real operating elements 60 which are combined with virtual operating elements 60' and 60'V and/or with speech input SpE, with the real operating elements preferably being adapted to be mutually combined, whereby the number of required operating elements can be reduced as well. In the illustrated embodiment, there are employed three keys 60, by means of which a multiplicity of functions can be carried out in the manner indicated hereinbefore. Further optimization of the operating function consists in distributing the operating elements to the fingers of the holding hand 1b 1, 2, 3, 4, 5 holding the display means, such that preferably the index finger 1, the middle finger 2 and the ring finger 3 operate the function keys, which renders possible considerably faster operation, while the small finger serves for locking the display part and the thumb is freely movable in order to effect, possibly in combination with speech and/or the real op-

erating elements or alone, operation of the virtual operating elements, i.e. input elements 60' displayed on the display area. To this end, the real operating elements 60 are preferably disposed on the rear side of a display area.

Further optimization of the operating functions 1c is the compressed arrangement of the operating elements AB in a portion FBh, which during holding of the display can be operated by means of the fingers, with said portion being preferably the area in the region of the lateral gripping edge, where the display-holding hand is situated most frequently, i.e. under ergonomic aspects in the middle region of a display side, since this location is the most balanced one for holding the display unit and is the most neutral one for operation by a left-hander or right-hander.

On the basis of an additional illustrative embodiment, in which an opened digital book is shown on the right side of Fig. 13 without indicating operating elements, the portion 2 of Fig. 13 shows all partial aspects of what, either commonly and/or separately from each other, plays a decisive role in reducing the elements disturbing or irritating in reading a document.

This includes the reduction of the real operating elements 60 to a necessary minimum and/or hiding the operating elements 60h e.g. on the side of the display unit 2b directed away from the display side. Fig. 2b illustrates the hidden arrangement of virtual manipulation elements, i.e. function elements 60', i.e. elements to be operated via the display area, which are made visible in common or separately from each other only in case of necessity, such that no first functional information for identifying e.g. a menu, is available and just the posi-

tion of a first input possibility 60'EF in relation to the display area provides orientation as to what functions are to be made available. Preferably, the corners 60'EF or central sides in the middle (not shown) of the display area serve for orientation. Fig. 2b shows furthermore an activation protection section 60ES which avoids inadvertent activation of a displayed or not displayed function 60' in the region of the gripping edge. To this end, an input e.g. via speech SpE or a real operating element 60', 60 or a different location on the display area, for example a corner 60MSF, is made for cancelling the input protection so that a function can be carried out. A further possibility of reducing disturbing elements 2c concerns already available operating and functional information, respectively, which for avoiding irritation of a displayed document, is located in an edge or a frame laterally of the document 60FR displayed, similar to the edge of a book or the passe-partout of a picture.

The operation concentrated to a specific region, preferably with rear-side or lateral combination keys which advantageously should not be more than three mutually separate operating elements, however without restriction thereto, provides better distribution of a multiplicity of tasks and the functions associated therewith in consideration of the calmest possible or most relaxed position during carrying or holding the display unit.

Fig. 14, by way of the example of a folded open, two-part digital book according to the invention, however without restriction thereto, shows the provision of operating information and the further handling thereof by means of operating elements facing away from the display area and/or by input via a sensitive input area, as well as the provision of a first item of functional informa-

tion and the further processing thereof via the sensitive input area.

5 Fig. 15 shows functional possibilities of a minimum configuration of operating elements of the digital book according to the invention, comprising a first function to perform a first task, using as example the provision of select information on the display area and the automatic and software-controlled reprogramming of the operating elements following said first operation, for fulfilling a second task, e.g. the selection and/or activation of a selected function or deactivation of said provision.

15 Fig. 16 shows the general combination possibility of an input area of the digital book according to the invention, using as example three real operating elements and their programming with regard to a first function and additional first functions rendered possible by combined operation, as well as the automatic, software controlled reprogramming of the operating elements by a first operating step, in order to fulfil another task in a second operating step.

25 Fig. 17, by way of the example of one-part and two-part display sections of the digital book according to the invention, shows the programming of the three operating elements preferably arranged on the rear side, for a digital book in which operation is effected via real operating elements only.

35 Fig. 18, by way of the example of one-part and two-part display sections, with an additional possibility of input via the display area (touchscreen), shows the programming of the three operating elements preferably arranged on the rear side, for a digital book in which the

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real operating elements in a first function realize the provision of operating information on the display area, for possible subsequent further processing or operating via a sensitive display area.

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Fig. 19, by way of the example of one-part and two-part display sections, shows the programming of the three operating elements for a digital book, which are preferably arranged on the rear side, as rapid-function operating elements for frequent routine operations, using as example a first function of operating elements of simple operation, for example for moving the pages within a book document, and processing of not so frequently required functions via the display area, which are made available by touching a location on the display area and which are programmed for example by initialisation of a coupled book document.

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Fig. 20, by way of the example of a corner function and a function in the middle of a lateral edge, shows an embodiment of Fig. 19, in which the lateral edge operations in the region of the gripping edge of the display unit are realized in addition in a document edge and/or frame in order not to irritate or disturb a document on display.

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Fig. 21, by way of the example of two corner functions indicated in the display area, shows an embodiment of Fig. 19, in which the lateral edge operations in the region of the gripping edge of the display unit are realized in addition in a document edge and/or frame in order not to irritate or disturb a displayed document.

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Fig. 22, by way of the example of a one-part embodiment of the present invention, shows the automatic and software-controlled programming of operating elements and

the resulting change in the displayed operating information by a coupled memory medium or an initialized document.

5 Fig. 23, by way of the example of a two-part embodiment of the present invention, shows the automatic switching over of a combined-display operating mode, during coupling of a second book document with the digital book, to a separate-display operating mode with corresponding  
10 display of the document on the display area as well as automatic switching over from a separate-display operating mode to a combined-display operating mode associated with a reverse process.

15 Fig. 24, by way of the example of a two-part embodiment of the digital book according to the invention, shows the activation and/or deactivation process of the digital book associated with coupling of a solid-state memory, as well as the attempt of installing and/or displaying the contents of the solid-state memory, which is  
20 effected automatically by coupling said solid-state element.

Fig. 25, by way of the example of a two-part embodiment  
25 of the digital book according to the invention, illustrates the coupling possibility of different external apparatus or means via a multifunction interface arranged at the bottom side of the digital book and designed as interface for cable connectors and/or of the  
30 supply station.

Fig. 26 shows in exemplary manner a hardware coupling and decoupling possibility by attaching or removing different hardware parts via the pivot hinge of a two-part  
35 digital book, which upon removing a part is the gripping

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As already described hereinbefore, the secondary part 2 or secondary parts 2a, 2b is/are designed to be electrically and/or mechanically separable from the main part 1, so that the main part 1 can be used alone. The at least one operating unit 6 contains as operating elements directional keys and function keys which can be operated individually or in combination for various functions.

Display unit D may advantageously have a function to indicate a power supply status, preferably on the screen of main part 1.

The screen 3 or screens 3, 4 of display unit D preferably is/are flexible, which holds also for the casing, so that the digital book can be carried along like a notebook, for example in the inside pocket of a jacket. The screen 3 or screens 3, 4 advantageously may be provided with an adjustable background illumination system. The display on the screen 3 or screens 3, 4 as well as the background illumination may be designed to be turned on or off automatically when the casing is folded open or shut.

The casing may be provided with a holding means (not shown) for receiving the screen pen 15 for use as operating, writing, drawing and/or processing tool.

Hint concerning the exemplary character of what has been described

The present invention is not restricted to the embodiments described. Rather, the expert may carry out various modifications of the embodiments without having to leave the scope of protection as it is defined by the claims.

**Patent Claims:**

- 5        1. A digital book at least as reproducing means, in particular for reproducing text information, characterized by
- 10            a) a casing (G) adapted to be folded open and shut like a book and having at least one folding axis (A), a main part (1) and at least one secondary part (2), said parts forming together a book back part (BR),
- 15            b) a display unit (D) at least of two-part design and arranged such that the main part (1) with at least one screen (3) and the at least one secondary part (2) with at least one screen (4), in the opened condition of the casing (G), are available to the user like pages of a book, for looking at and optionally for working on as required,
- 20            c) a control unit (10) having means for receiving, storing, processing and reproducing information which may be in the form of text, image, graphical, audio and/or video information,
- 25            d) at least one operating unit (6) having operating elements for using the digital book as information receiving/processing/reproducing means,
- 30            e) an interface unit (11) for inputting and outputting information and for supplying energy, and
- f) a power supply means (12) for supplying energy to the units (D, 10, 11).
- 35        2. The digital book of claim 1, characterized in that the secondary part (2) or parts (2a, 2b) is/are designed to be electrically

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and/or mechanically separable from the main part (1), so that the main part (1) can be used alone.

- 5 3. The digital book of claim 1,  
characterized in that the interface unit (11) contains means (12, 13) for transferring information and energy.
- 10 4. The digital book of claim 3,  
characterized in that the interface unit (11) contains an insertion channel (5) having at least a reading means, for insertion of a PC card (5') or the like for electrical connection thereof to the interface unit (11) at least for reading the PC card  
15 (5') or the like.
- 20 5. The digital book of claim 1 or 2,  
characterized in that there is provided a supply unit (VE) acting as accessory means for the digital book and designed such that it has a receiving opening (VE') and a guide and supply pin (7), said digital book, in the closed condition of the casing (G), being adapted to be inserted therein by means of the guide and supply pin (7) for inputting and out-  
25 putting information, for feeding energy and for storage of the digital book.
- 30 6. The digital book of any of the claims 1 to 4,  
characterized in that the control unit (10) having said means for receiving, storing, processing and reproducing information contains a control means comprising at least one RAM, a ROM and/or an EPROM, at least one processor CPU, at least one driver circuit TR and a bus line BL.
- 35 7. The digital book of claim 1,

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characterized in that the at least one operating unit (6) contains as operating elements directional keys and function keys which can be operated for different functions individually or in combination.

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8. The digital book of claim 1, characterized in that the display unit (D) has a function for indicating the power supply status preferably on the screen of the main part (1).

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9. The digital book of claim 1 or 2, characterized in that the screen (3) or screens (3, 4) of the display unit (D) is/are flexible, that an adjustable background illumination is provided for the screen (3) or screens (3, 4), and in that the display on the screen (3) or screens (3, 4) as well as the background illumination can be turned on or off automatically as the casing (G) is folded open or shut.

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10. The digital book of claim 1 or 2, characterized in that the casing (G) is provided with a holding means for receiving a screen pen (15) for use as operating, writing, drawing and/or processing tool.

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11. A digital book, in particular for the reproduction of text and image information, comprising:

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- a) a casing (G) having a sheet-like display unit (D) with at least one flat screen (3, 4),
- b) at least one manipulation region (60h) for use by a user,
- c) said manipulation region being designed in the edge zone of the display unit (D) such that the user can execute operations with the fingers of a hand.

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12. The digital book of claim 11,  
characterized in that

a) the manipulation region (60h) has provided  
therein at least two operating elements adapted  
to be actuated, and

b) the arrangement of the operating elements adapt-  
ed to be actuated in the manipulation region  
(60h) is such that said operating elements can  
be actuated simultaneously with the fingers of a  
hand.

13. The digital book of claim 11 or 12,

characterized in that the process of operation can  
be carried out by actions of the fingers of the user  
on the manipulation region (60h), without this ne-  
cessitating substantial shifting of the wrist of the  
user's hand relative to the casing (G).

14. The digital book of claim 11, 12 or 13,

characterized in that the casing (G) within the ma-  
nipulation region (60h) has operating elements  
adapted to be operated, which are arranged on the  
side directed away from the flat screen.

15. The digital book of any of claims 11 to 14,

characterized in that the screen (3,4) is designed  
as pressure-sensitive touchscreen at least in the  
manipulation region.

16. The digital book of claim 15,

characterized in that the screen (3,4) is designed  
as pressure-sensitive touchscreen at least in its  
edge portion, with at least one screen corner por-  
tion or a portion located in the middle of an edge  
section being adapted to be operated for triggering  
specific functions.



17. The digital book of any of claims 13 to 16,  
characterized in that the operating elements and/or  
the pressure-sensitive areas of the screen (3, 4)  
individually or in combination trigger

- 5       - leafing-through functions for navigating in the  
          book contents displayed,
- providing functions for selection menus or
- selection functions within selection menus pro-  
          vided.

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18. The digital book of claim 17,  
characterized in that specific operating elements  
and/or pressure-sensitive areas of the screen (3, 4)  
individually or in combination, in the basic mode,  
15       are associated with a specific first functionality,  
      but immediately after triggering a providing func-  
      tion for a selection menu trigger, in a selection  
      mode, a selection function within this selection  
      menu provided.

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19. The digital book of claim 17 or 18,  
characterized in that the selection menus are indi-  
cated exclusively in an edge portion of the screen,  
without covering the book contents displayed.

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20. A digital book, in particular for the reproduction  
of text and image information, comprising:

- a) a casing having a sheet-like display unit (D)  
    with at least one flat screen (3, 4),
- 30   b) at least one manipulation region (60h) for oper-  
      ating by a user,
- c) at least one operating element adapted to be  
      actuated, which is arranged within the manipula-  
      tion region (60h) on the side directed away from  
35       the flat screen (3, 4),

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d) said operating element, upon actuation, providing at least one selection menu or selecting a selection menu provided.

5        21. The digital book of claim 20,  
characterized in that the screen (3, 4) is designed  
as pressure-sensitive touchscreen at least in the  
manipulation region.

10       22. The digital book of claim 21,  
characterized in that the screen (3,4) is designed  
as pressure-sensitive touchscreen at least in its  
edge portion, with at least one screen corner por-  
15       tion or a portion located in the middle of an edge  
portion being adapted to be operated for triggering  
specific functions.

20       23. The digital book of any of claims 21 or 22,  
characterized in that the operating elements and/or  
the pressure-sensitive areas of the screen (3,4)  
individually or in combination trigger  
- leafing-through functions for navigating in the  
book contents displayed,  
- providing functions for selection menus or  
25       - selection functions within selection menus pro-  
vided.

30       24. The digital book of claim 23,  
characterized in that specific operating elements  
and/or pressure-sensitive areas of the screen (3, 4)  
individually or in combination, in the basic mode,  
are associated with a specific first functionality,  
but immediately after triggering a providing func-  
tion for a selection menu trigger, in a selection  
35       mode, a selection function within this selection  
menu provided.

25. The digital book of claim 23 or 24,  
characterized in that the selection menus are indi-  
cated exclusively in an edge portion of the screen,  
without covering the book contents displayed.

5

26. A digital book, in particular for the reproduction  
of text and image information, comprising:

- a) a casing (G) having a sheet-like display unit  
(D) with at least one flat screen (3, 4),
- 10 b) the screen (3, 4) being designed as pressure-  
sensitive touchscreen at least in the edge por-  
tion, and
- c) operation of the pressure-sensitive touchscreen  
at at least one predetermined location causing  
15 the screen to be switched over to a selection  
mode with at least one selection menu.

27. The digital book of claim 26,  
characterized in that the screen (3, 5) in the basic  
20 mode reproduces the book contents without selection  
menus.

28. A digital book, in particular for the reproduction  
of text and image information, comprising:

- 25 a) a display unit (D) having at least one screen  
(3, 4),
- b) an operating means allowing the user to carry  
out operations,
- b) a coupling means for electric coupling of a data  
30 carrier unit,
- c) said coupling means, after coupling of the data  
carrier unit, automatically reading out data  
from the data carrier unit, and
- d) both the book contents displayed on the display  
35 unit and the entirety of the operating functions

available to the user being determined by the data read out from the data carrier unit.

- 5 29. A digital book, in particular for the reproduction of text and image information, comprising:
- a) a casing (G) having a display unit (D) with at least one screen (3, 4),
  - b) the rear side of the display unit (D) having a substantially cylindrical concave first inward curvature,
  - 10 c) with at least one outer edge of the display unit (D) being designed as a gripping handle and being of larger thickness than the display unit in the inwardly curved region.
- 15 30. The digital book of claim 29, characterized in that at least one gripping handle contains electronic components.
- 20 31. The digital book of claim 30, characterized in that at least one gripping handle contains a power supply means.
- 25 32. The digital book of claim 29, 30 or 31, characterized in that two opposite outer edges of the display unit are designed as gripping handles.
- 30 33. The digital book of any of claims 29 to 32, characterized in that the rear side of the display unit (D) has a substantially cylindrical concave second inward curvature which is arranged perpendicularly to said first inward curvature.
- 35 34. The digital book of any of claims 29 to 33, characterized in that at least one gripping handle is provided with an electric plug means.

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35. The digital book of any of claims 29 to 34,  
characterized in that the rear side of the display  
unit has at least one operating element.
- 5 36. The digital book of any of claims 29 to 25,  
characterized in that the rear side of the display  
unit is compressible.
- 10 37. The digital book of any of claims 29 to 36,  
characterized in that the display unit is adapted to  
be bent.
- 15 38. A digital book, in particular for the reproduction  
of text and image information, comprising an elec-  
trical pluggable connector means for power supply  
and/or for transferring data signals from or to oth-  
er information processing systems.
- 20 39. The digital book of claim 38,  
characterized in that the connector means is  
arranged in the lower edge of the display means.
- 25 40. The digital book of claim 39,  
characterized in that the book is of two-part con-  
struction and the connector means is arranged in the  
region of the bottom side of the pivot hinge.
- 30 41. The digital book of any of claims 38 to 41,  
characterized in that the connector means is a jack  
plug device.
- 35 42. The digital book of claim 41,  
characterized in that the connector means serves as  
holding means for setting the digital book in a sup-  
ply station.

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43. The digital book of claims 38 to 42,  
characterized in that the connector means is adapted  
to be used for connection with various apparatus.
- 5 44. A digital book, in particularly for the reproduction  
of text and image information, comprising a display  
unit (D) having at least one screen (3, 4), with the  
display unit being of flexible construction.
- 10 45. The digital book of claim 44,  
characterized in that the display unit is pressure-  
compressible.
- 15 46. The digital book of claim 44 or 45,  
characterized in that the display unit is adapted to  
be bent.

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Abstract:

5 A digital book comprising a casing which is adapted to  
be folded open and shut like a book and which has at  
least one folding axis (A), a main part (1) and at least  
one secondary part (2), said parts together forming a  
book back part (BR). A display unit consists of at least  
10 two parts and is arranged in such a way that when the  
casing is folded out, the main part (1) and the at least  
one secondary part (2) are each presented to the user  
with at least one screen each, like pages of a book, for  
looking at or optionally, for working on as required.  
15 The digital book contains a control unit with means for  
receiving, storing, processing and reproducing informa-  
tion, and at least one operating unit (6) with operating  
elements for using the digital book as a device for re-  
ceiving/processing/reproducing information. Furthermore,  
20 there is provided a supply unit (VE) which is designed  
such that it has a receiving opening (VE') and a guide  
and supply pin (7), by means of which the digital book  
can be plugged in when the casing is folded shut, for  
inputting and outputting information, for supplying en-  
25 ergy and for storing the digital book.

(Fig. 5)

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FIG 1

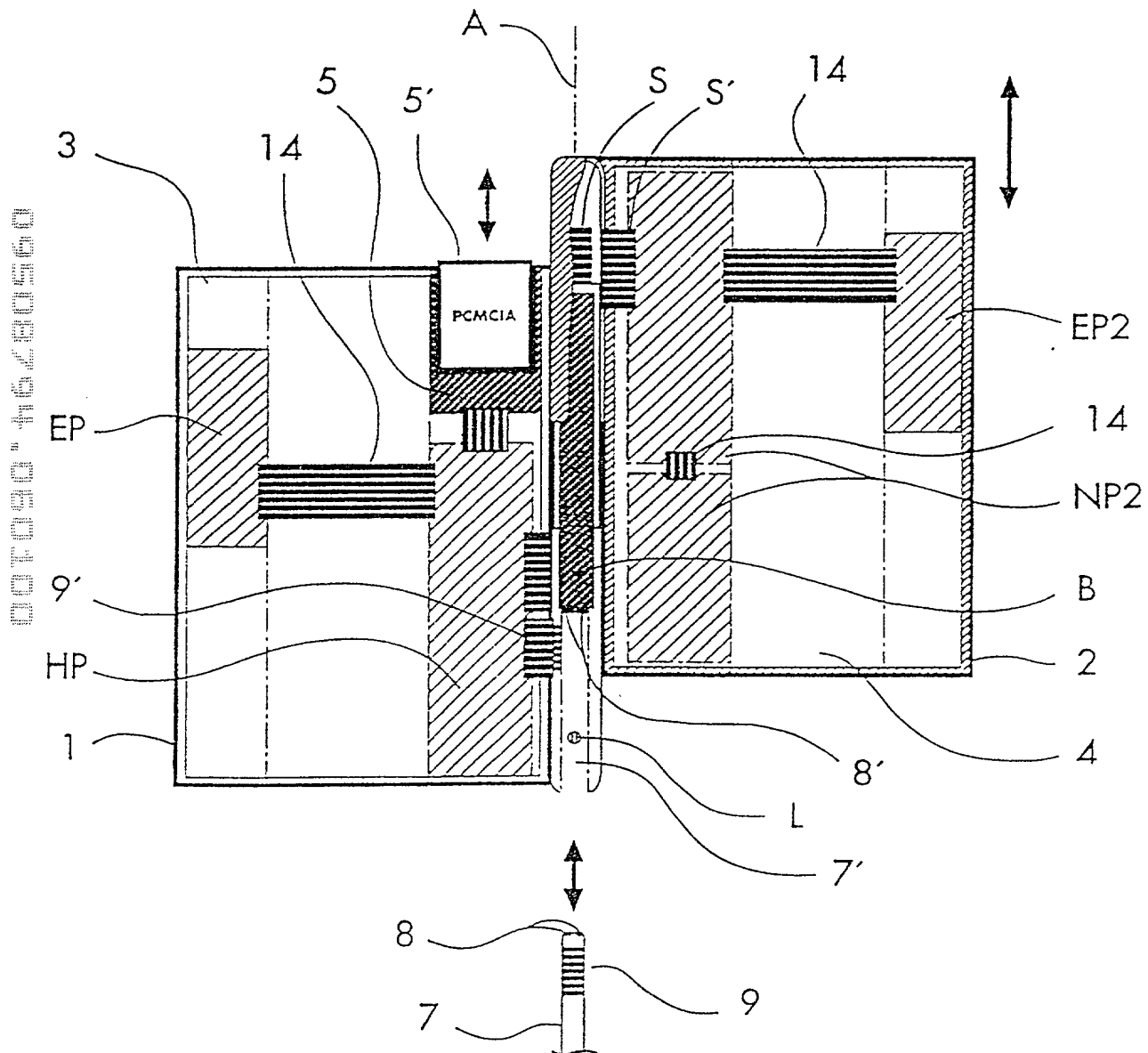




FIG 2

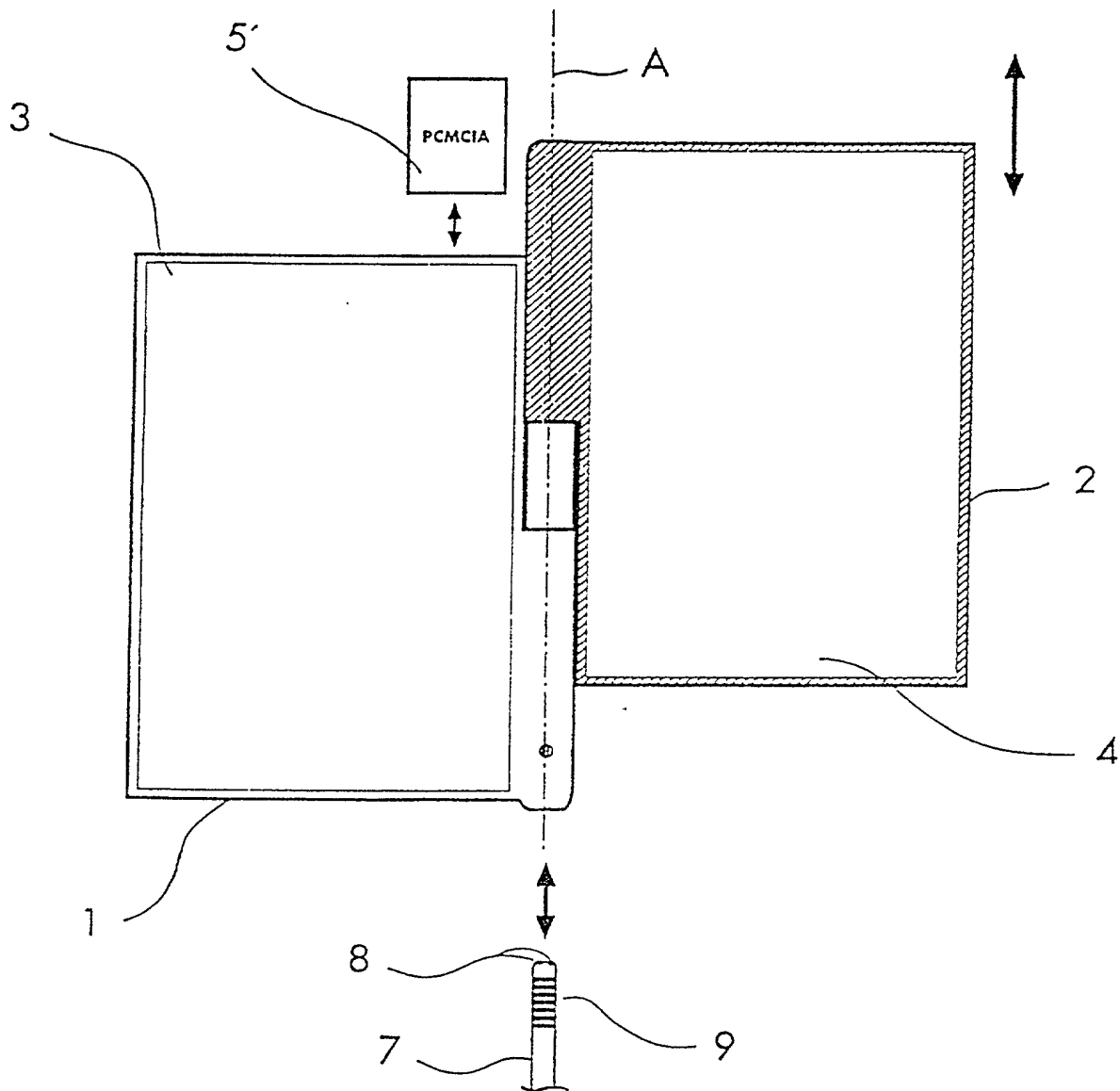


FIG 3

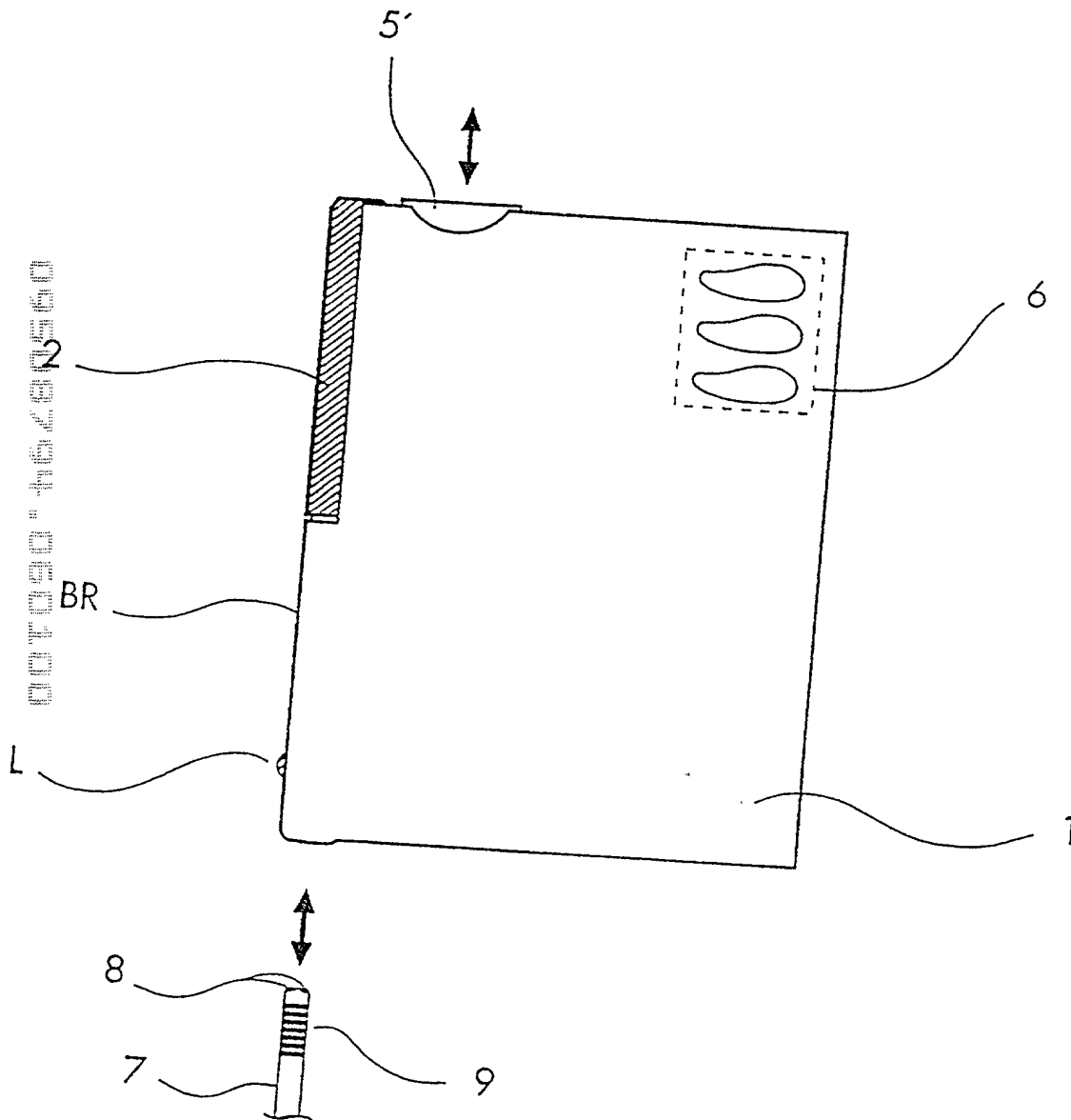


FIG 4

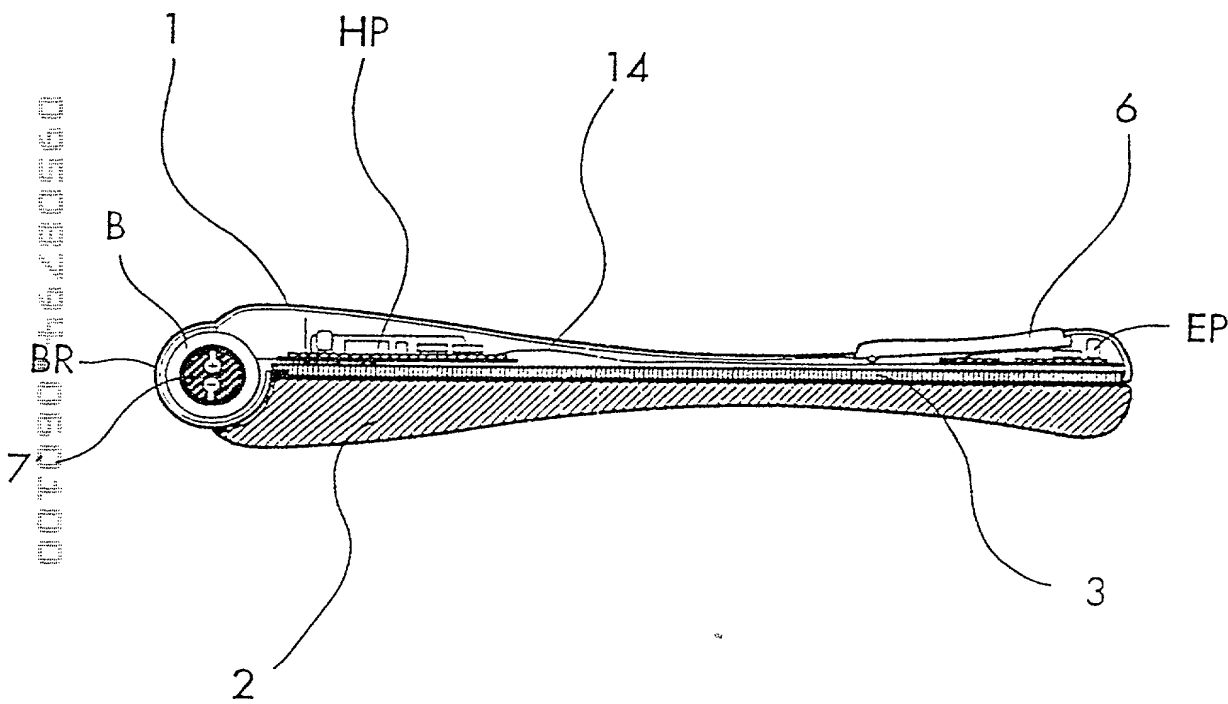
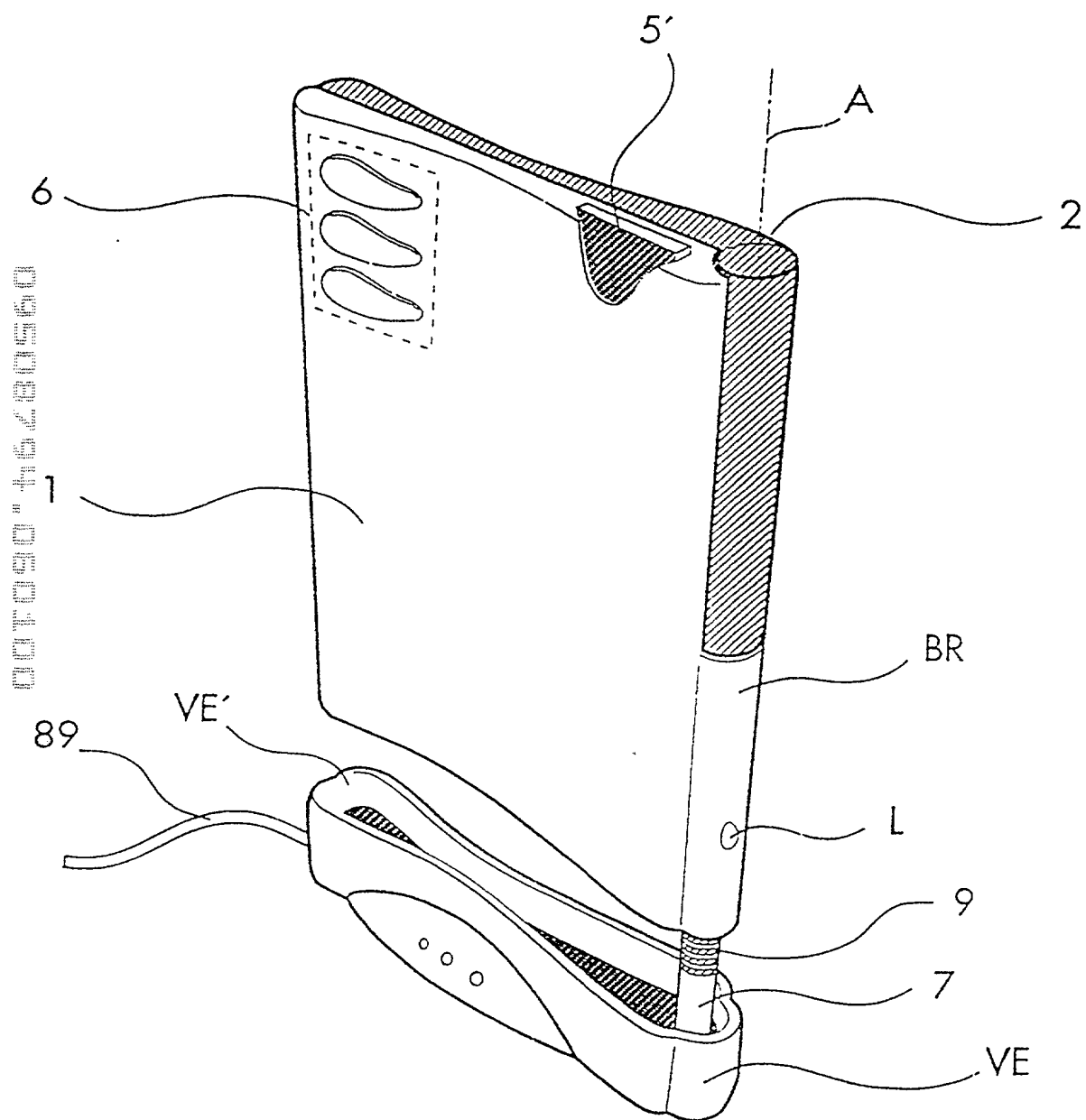


FIG 5



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FIG 6

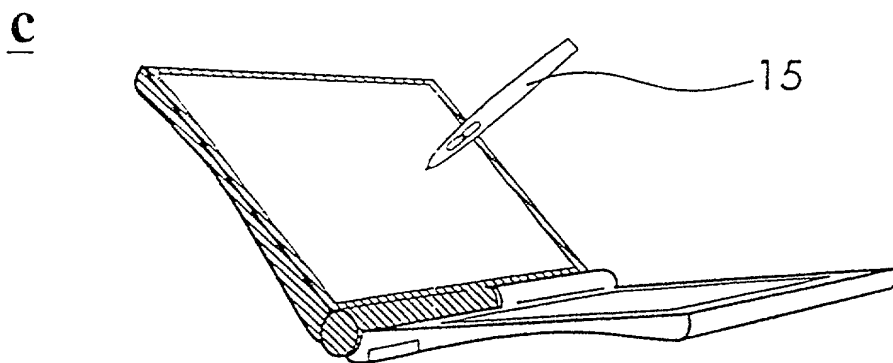
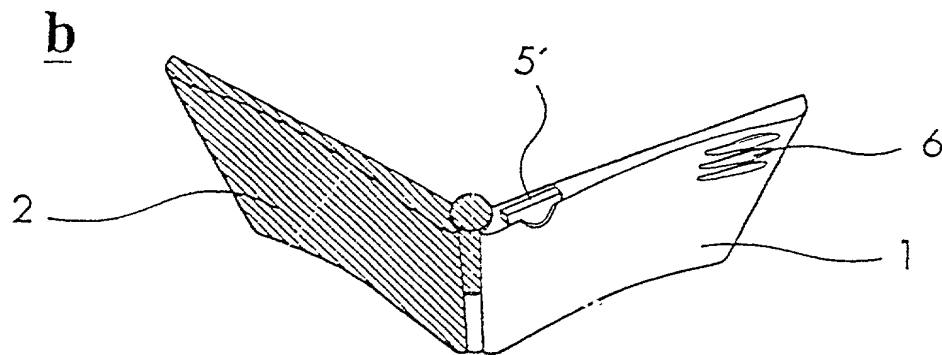
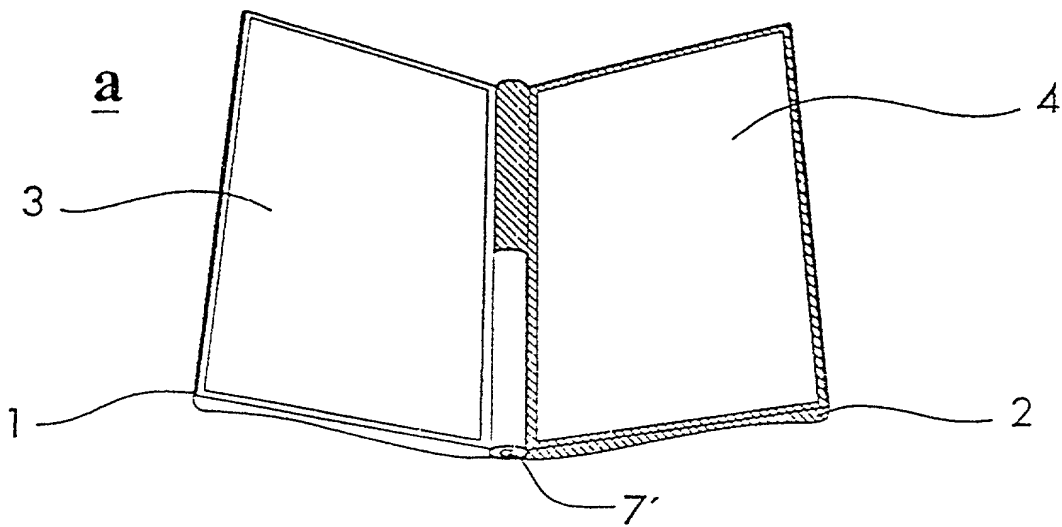
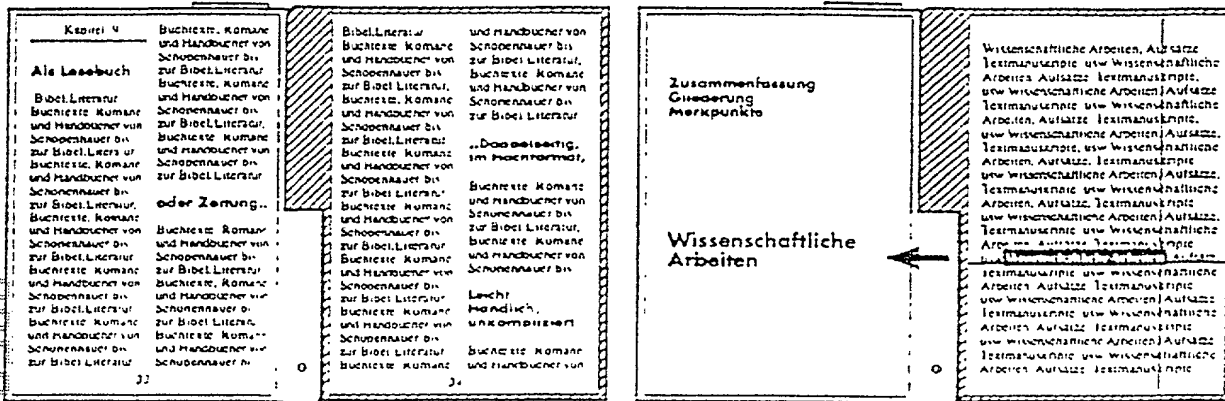
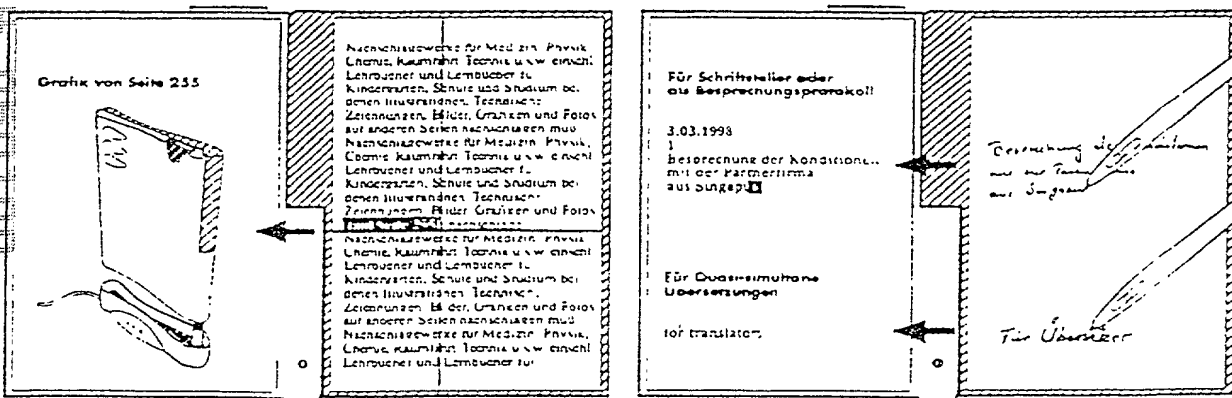


FIG 7

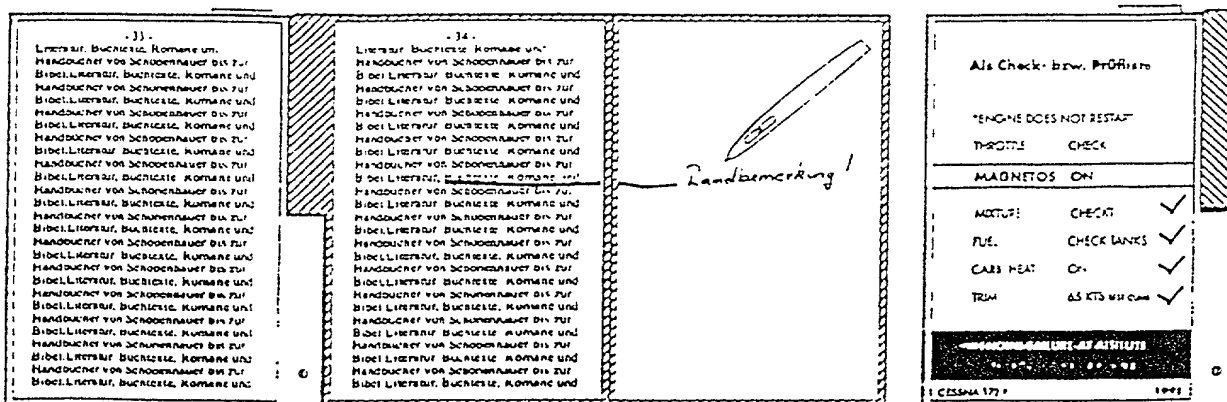
b



d

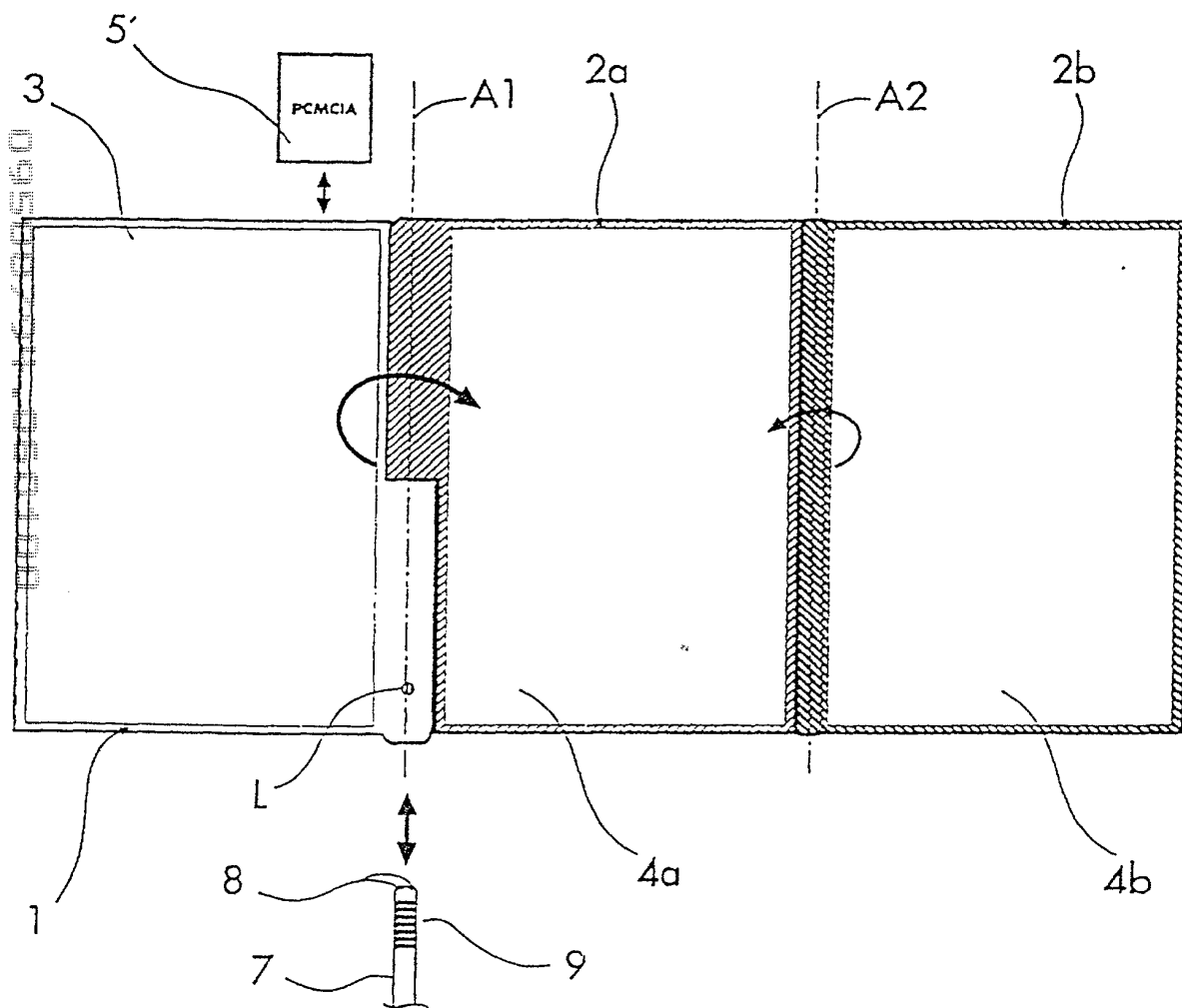


f



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FIG 8



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FIG 9

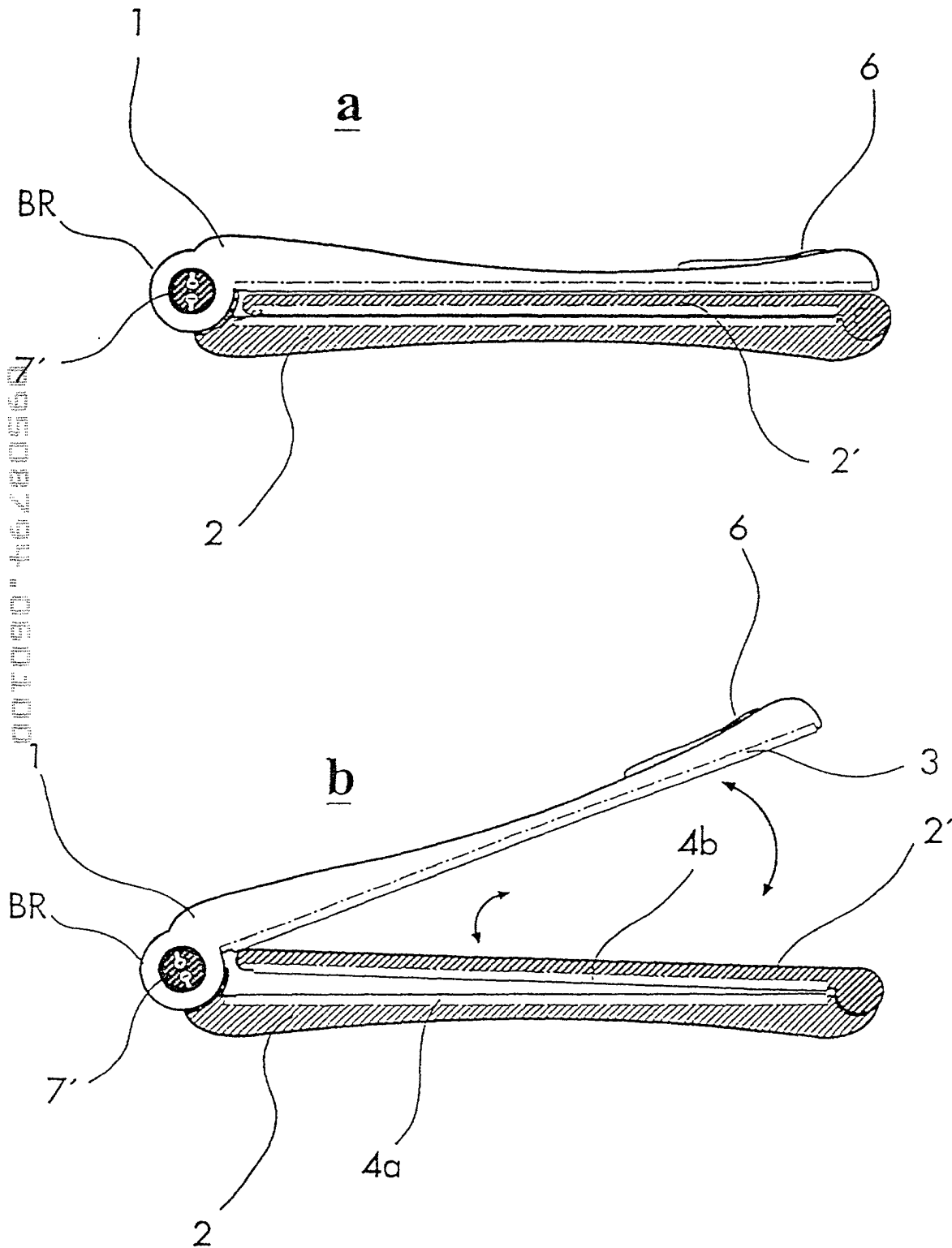
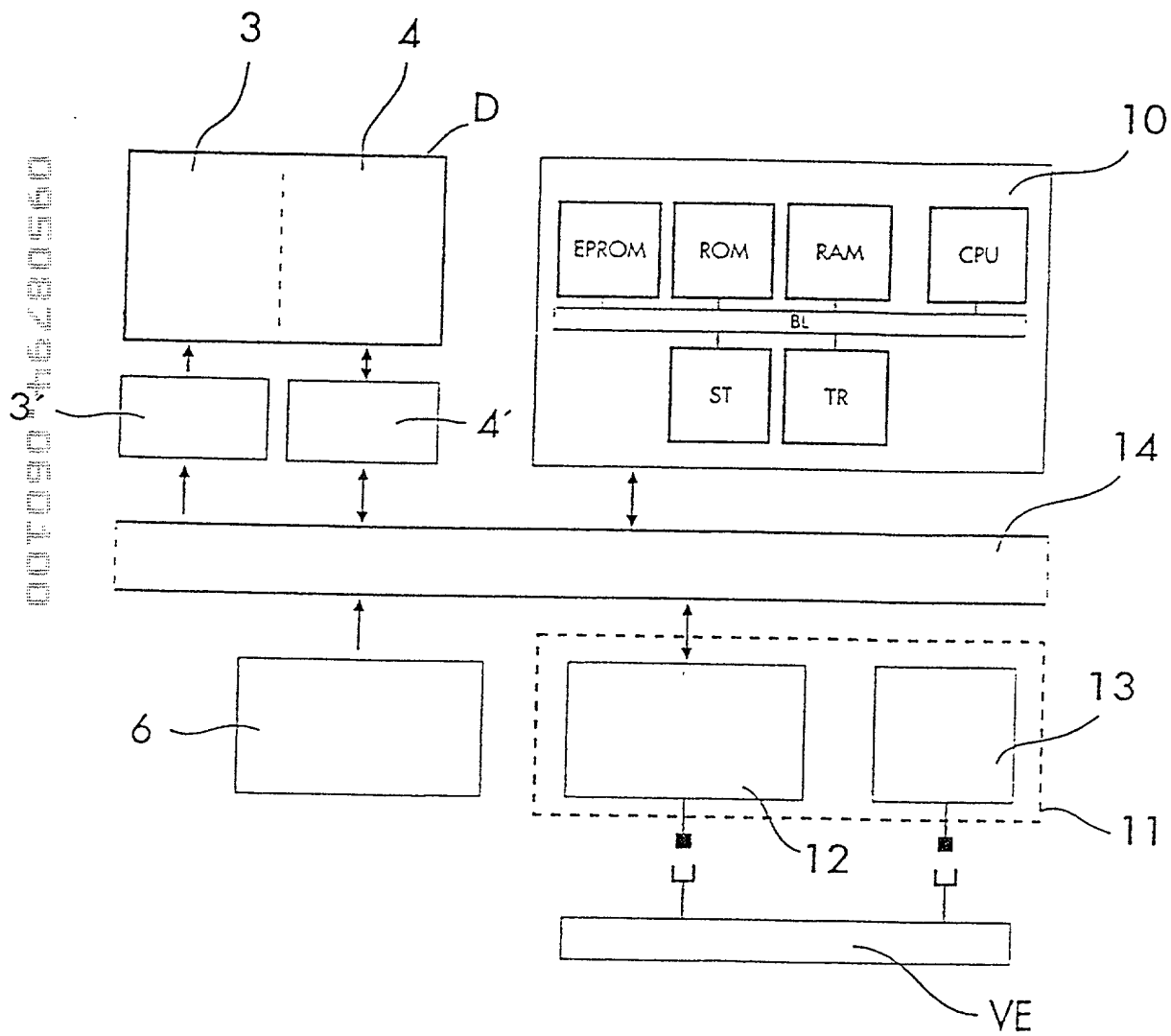


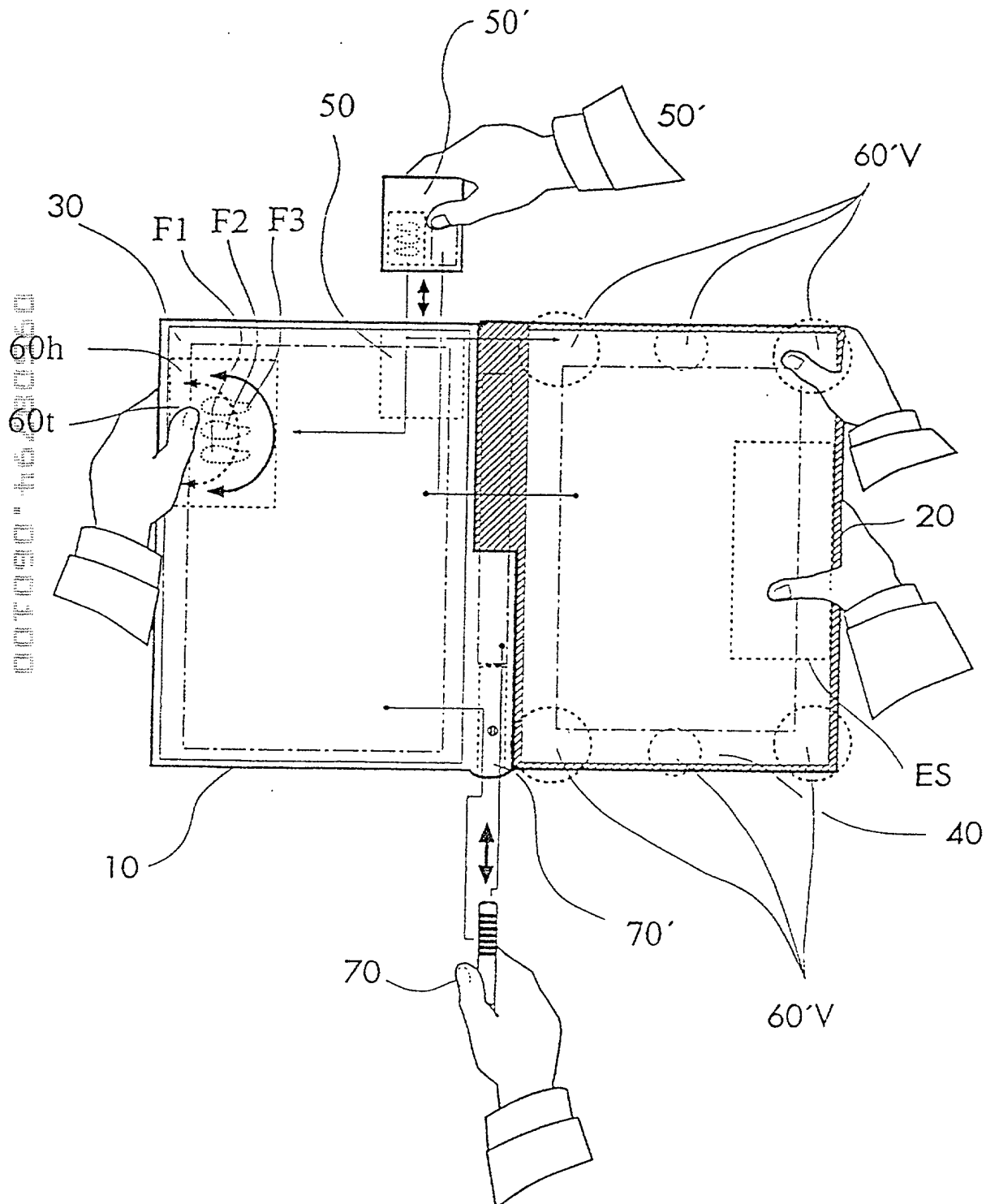


FIG 10



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FIG 11



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FIG 12

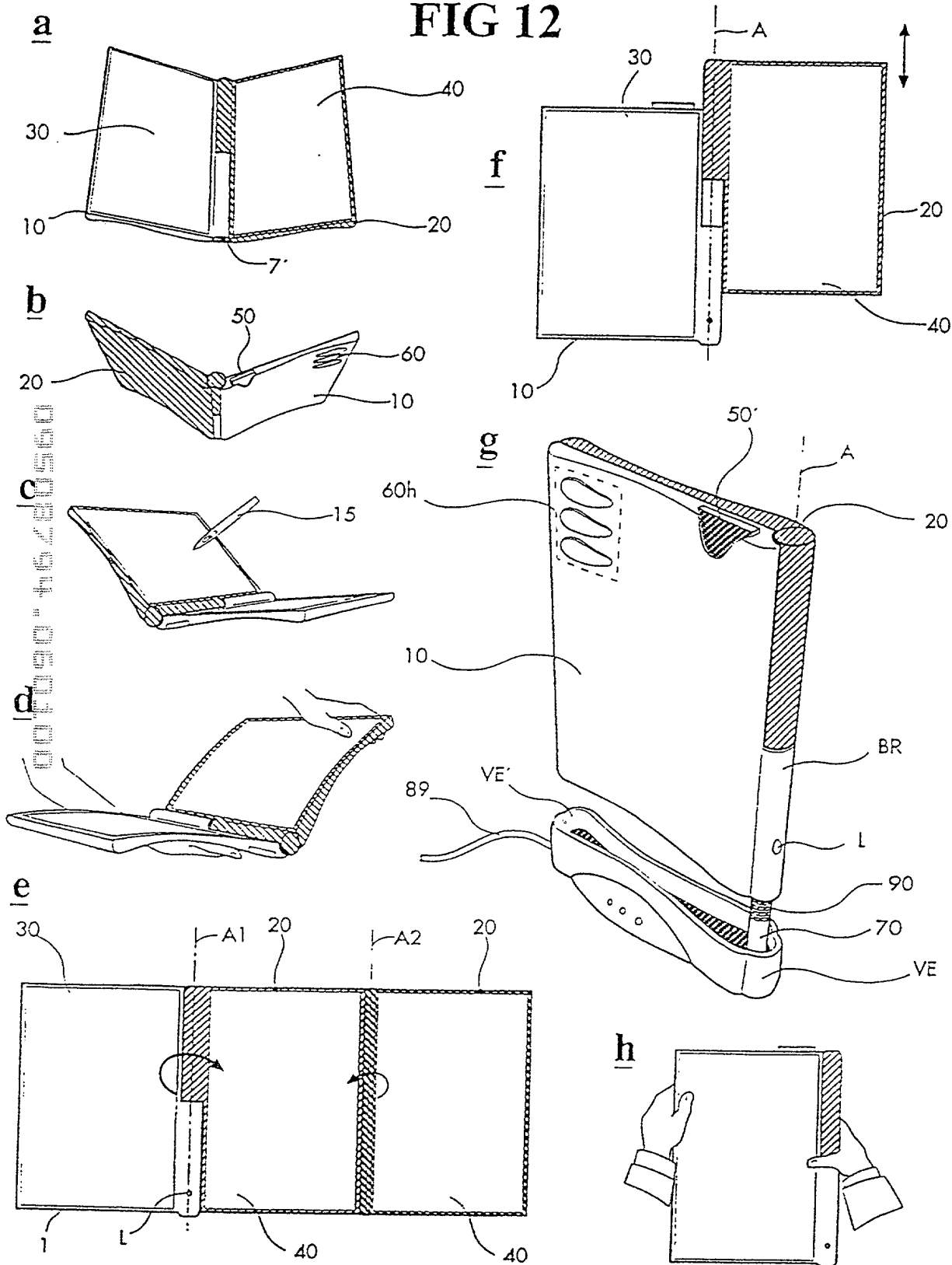
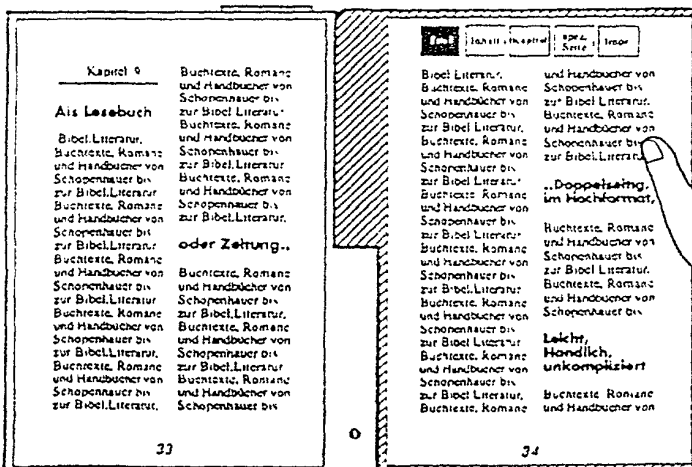
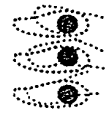
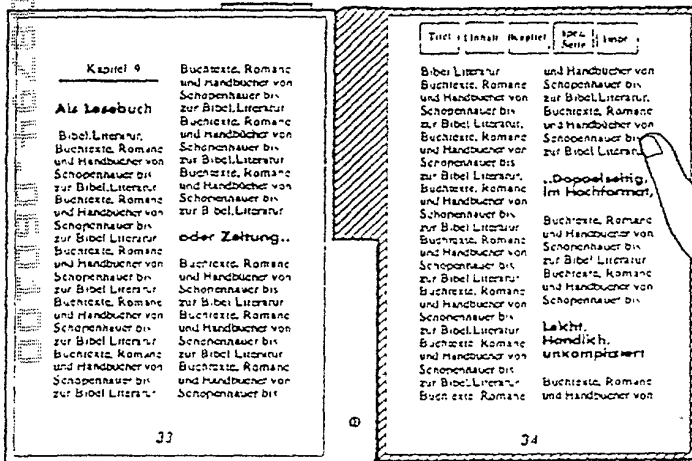
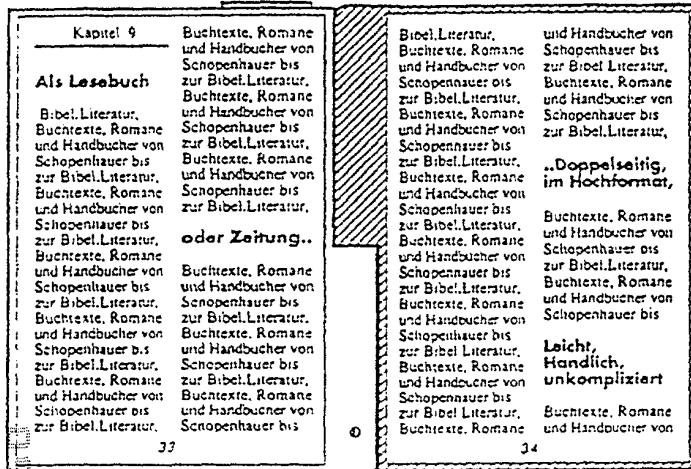




FIG 14a



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FIG 14b

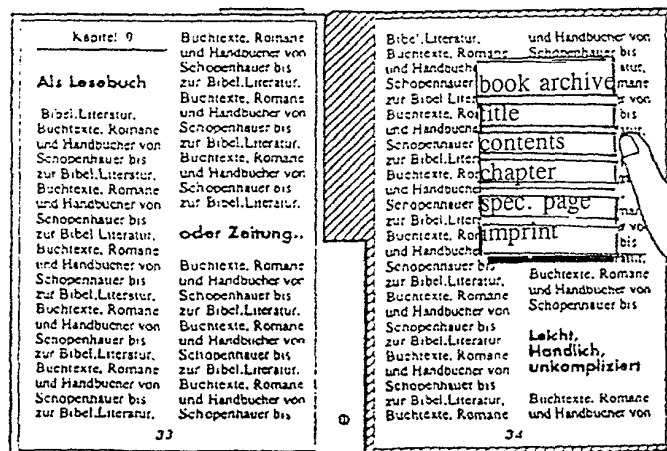
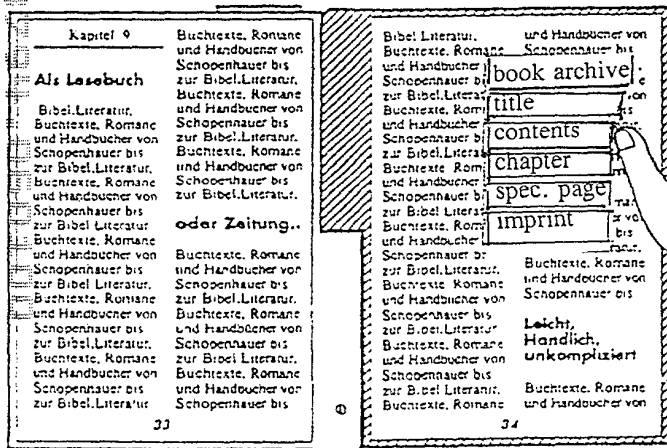
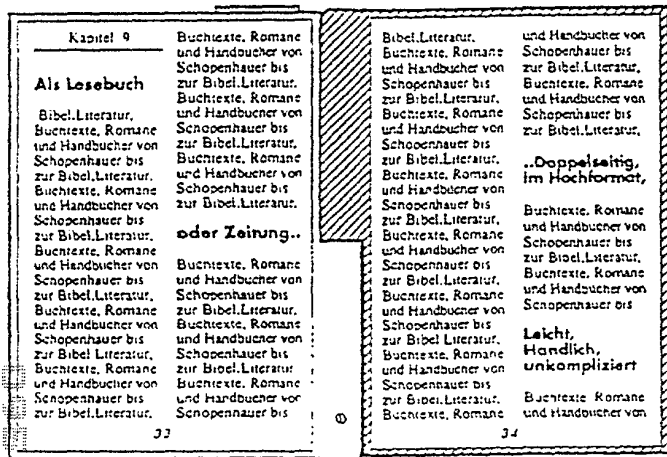
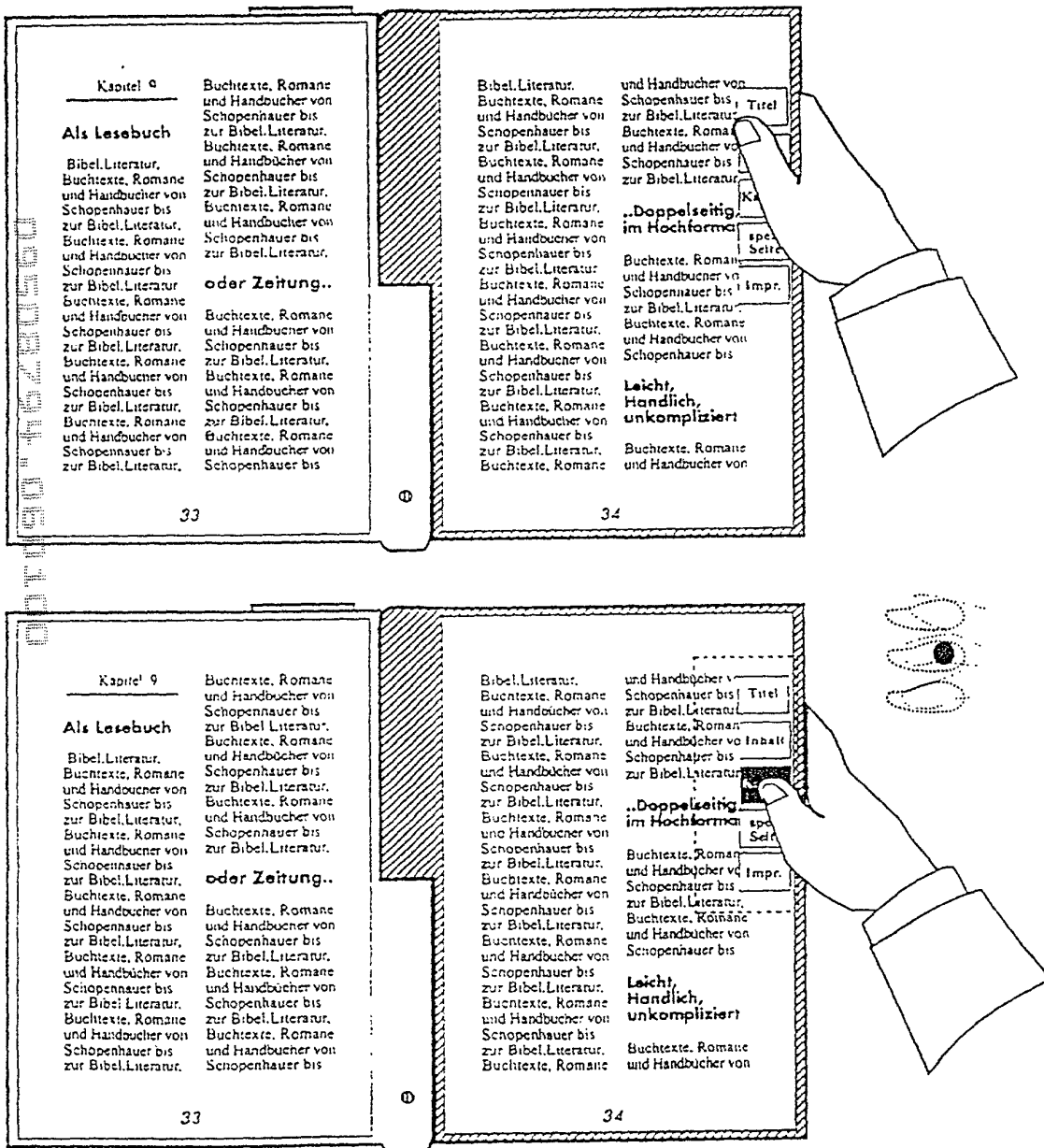
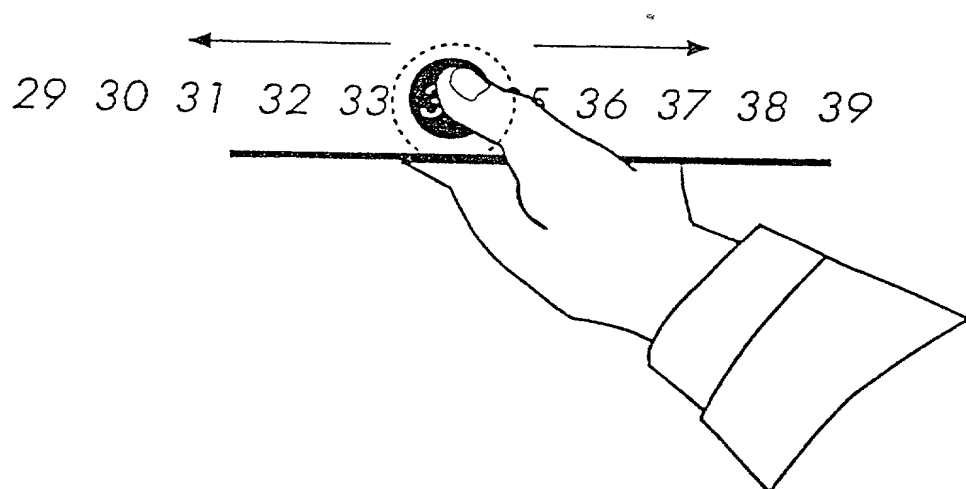
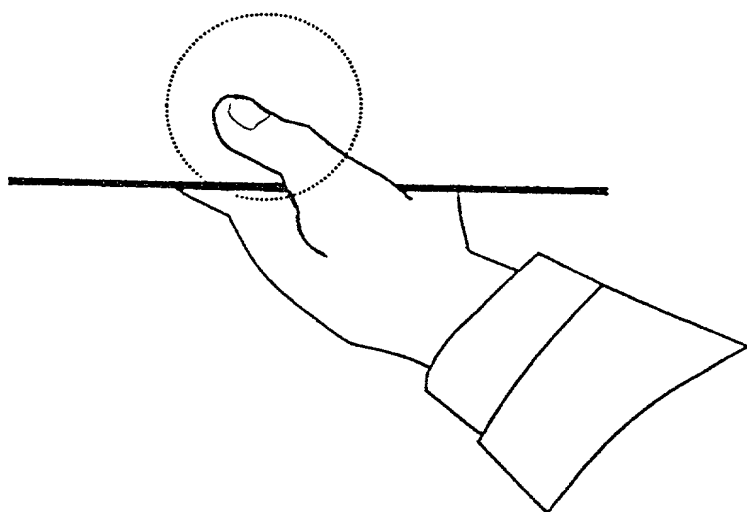


FIG 14c



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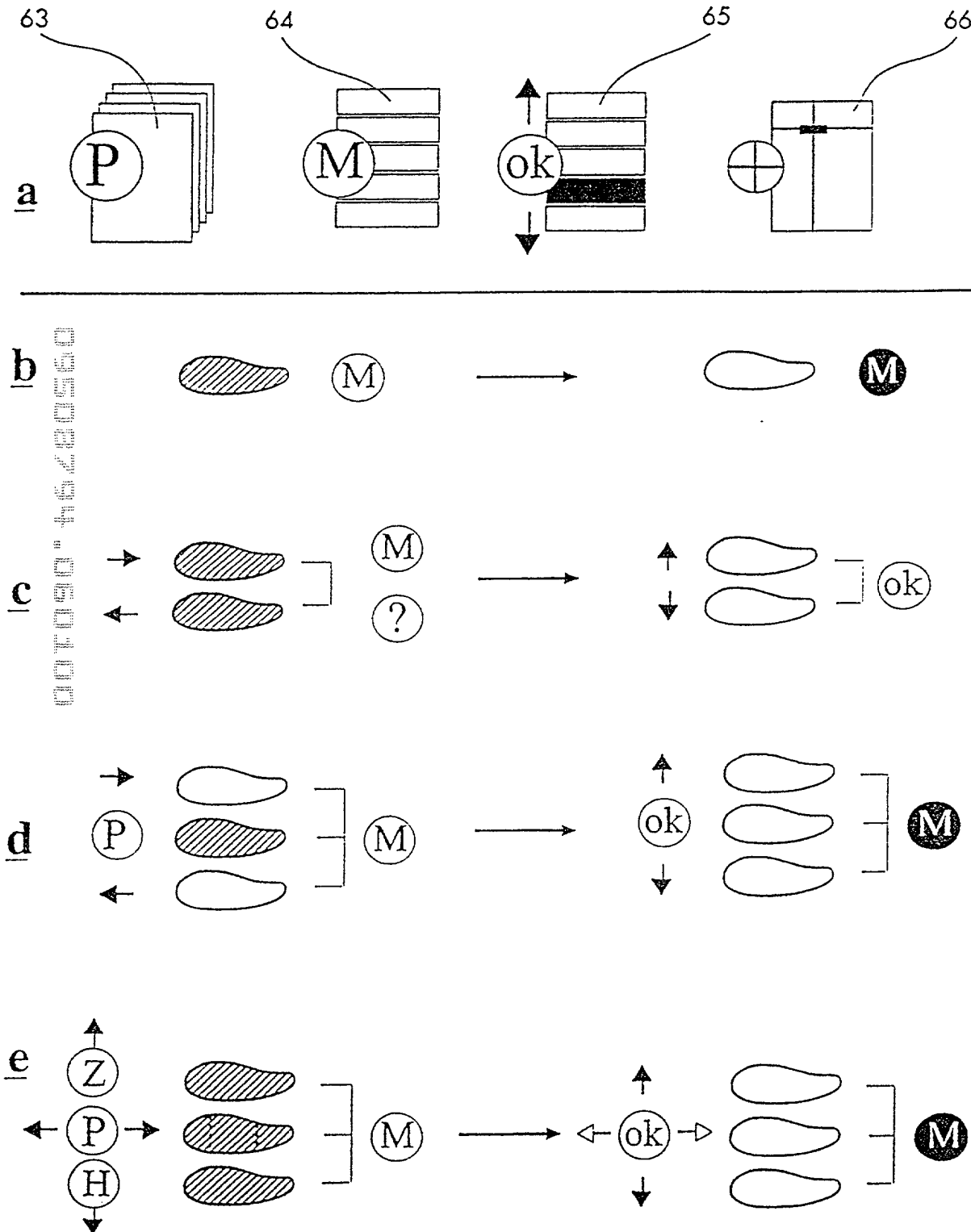
FIG 14d





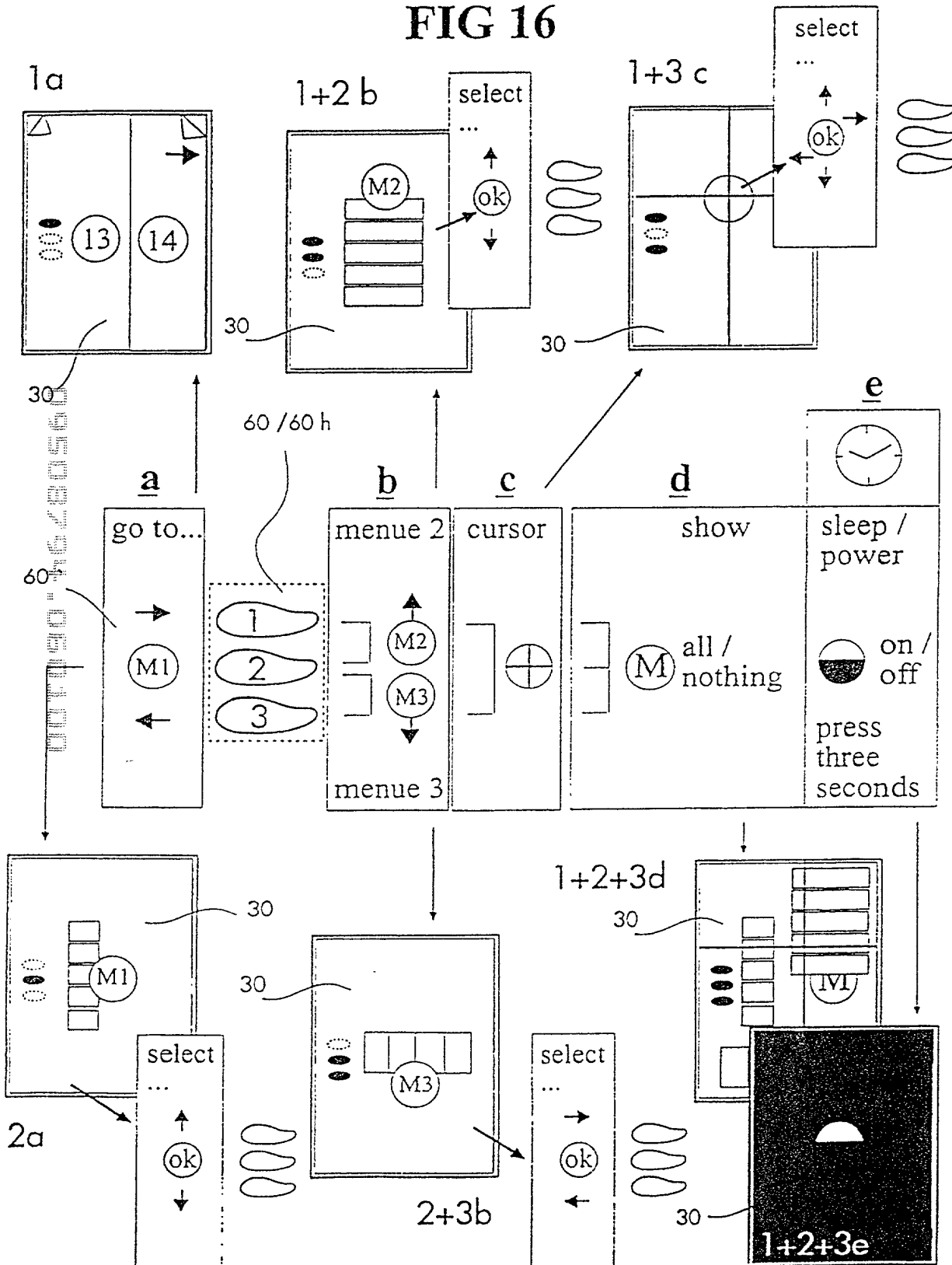
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FIG 15



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FIG 16



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FIG 17a

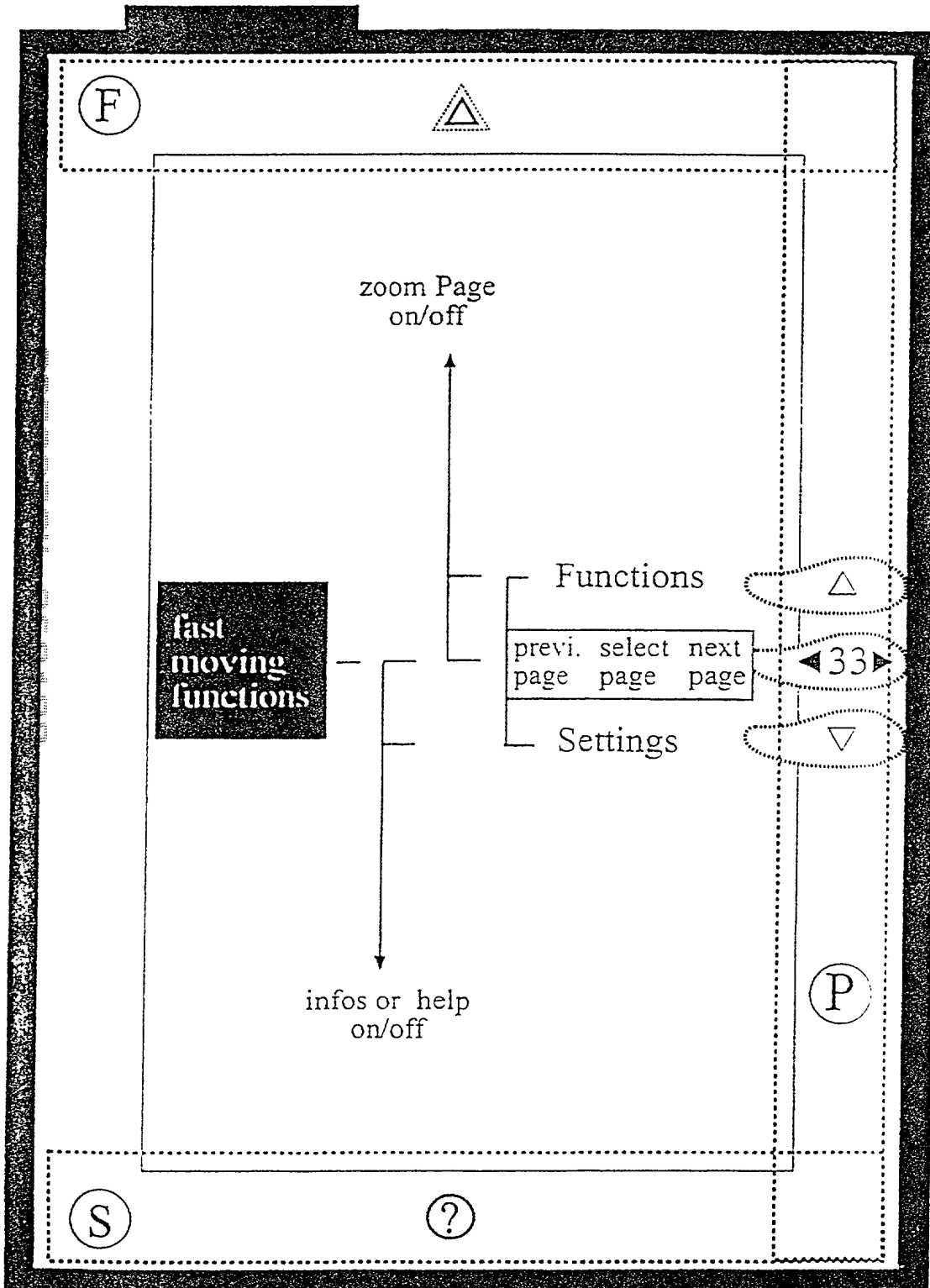
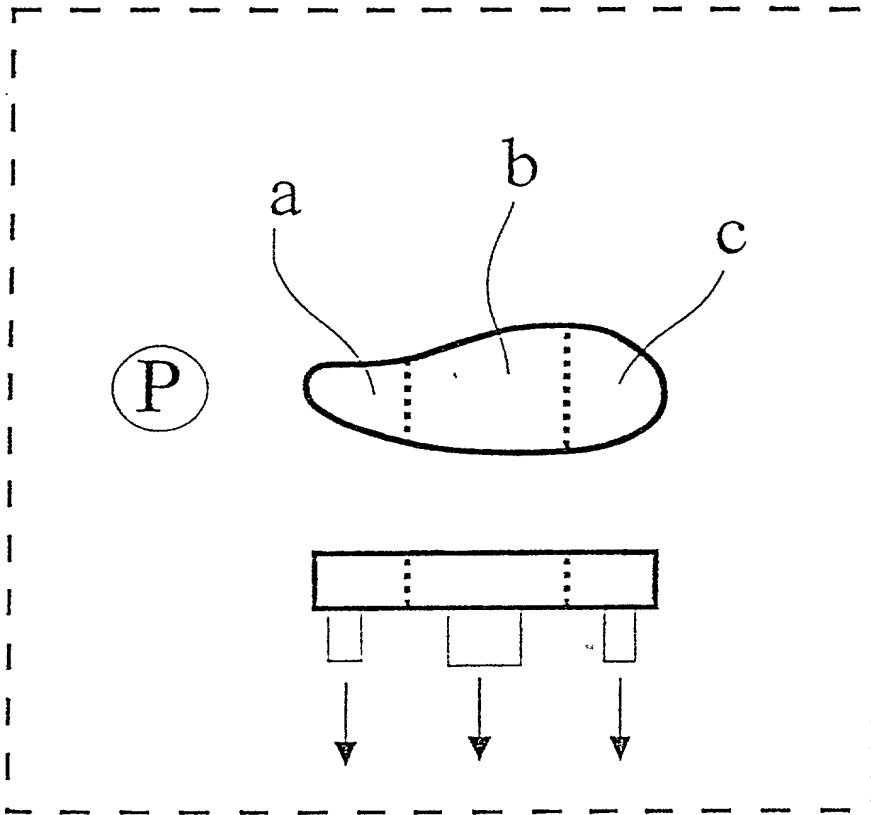


FIG 17b



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FIG 17c

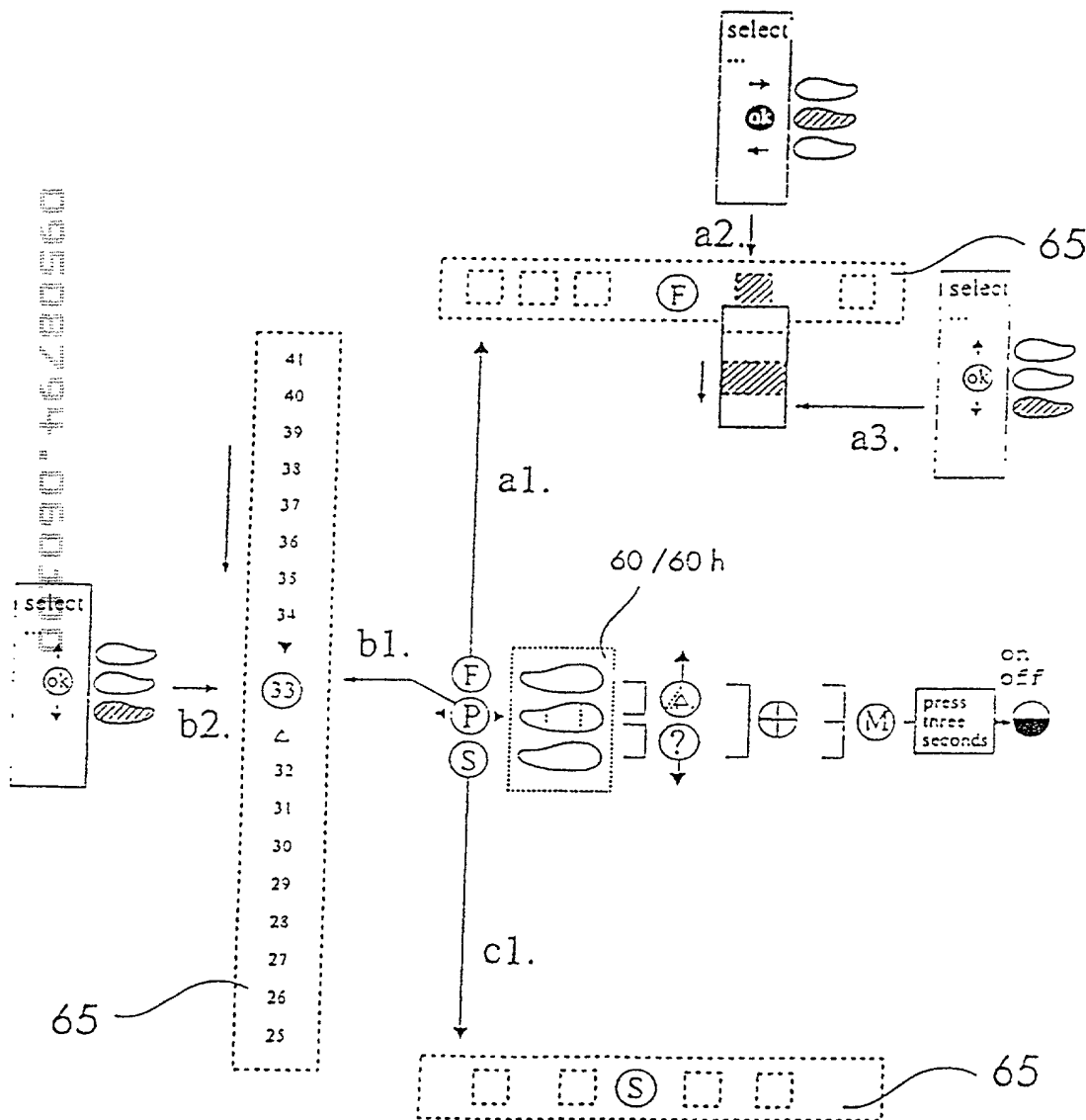
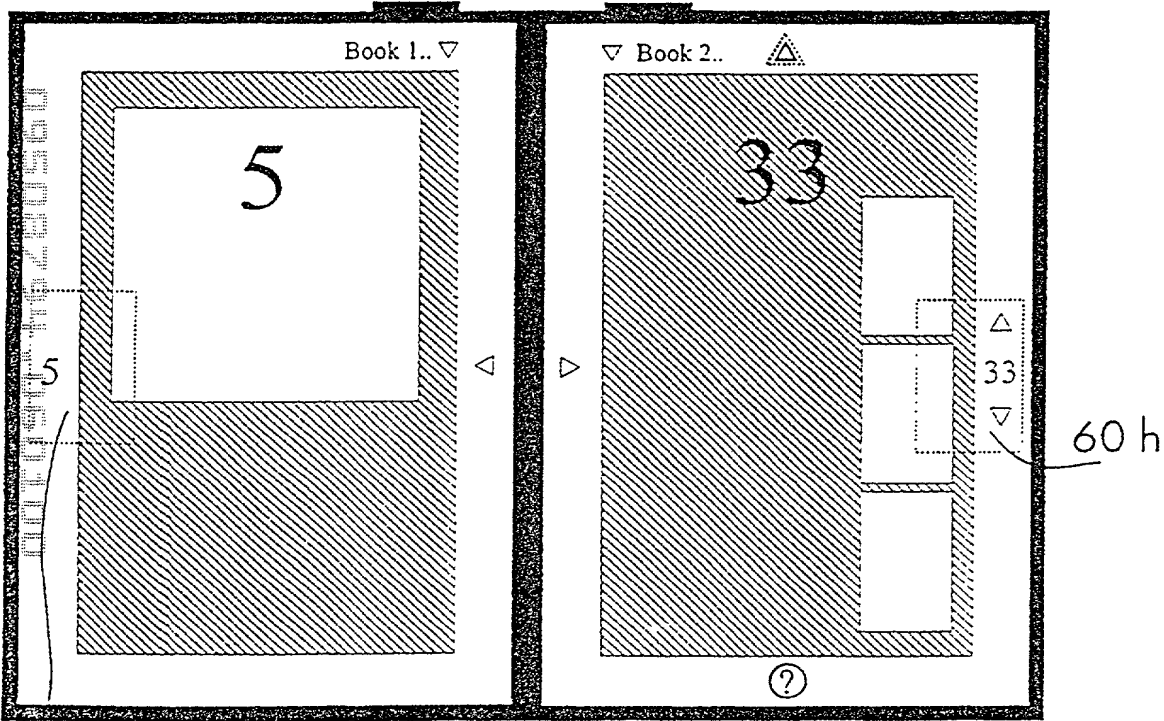
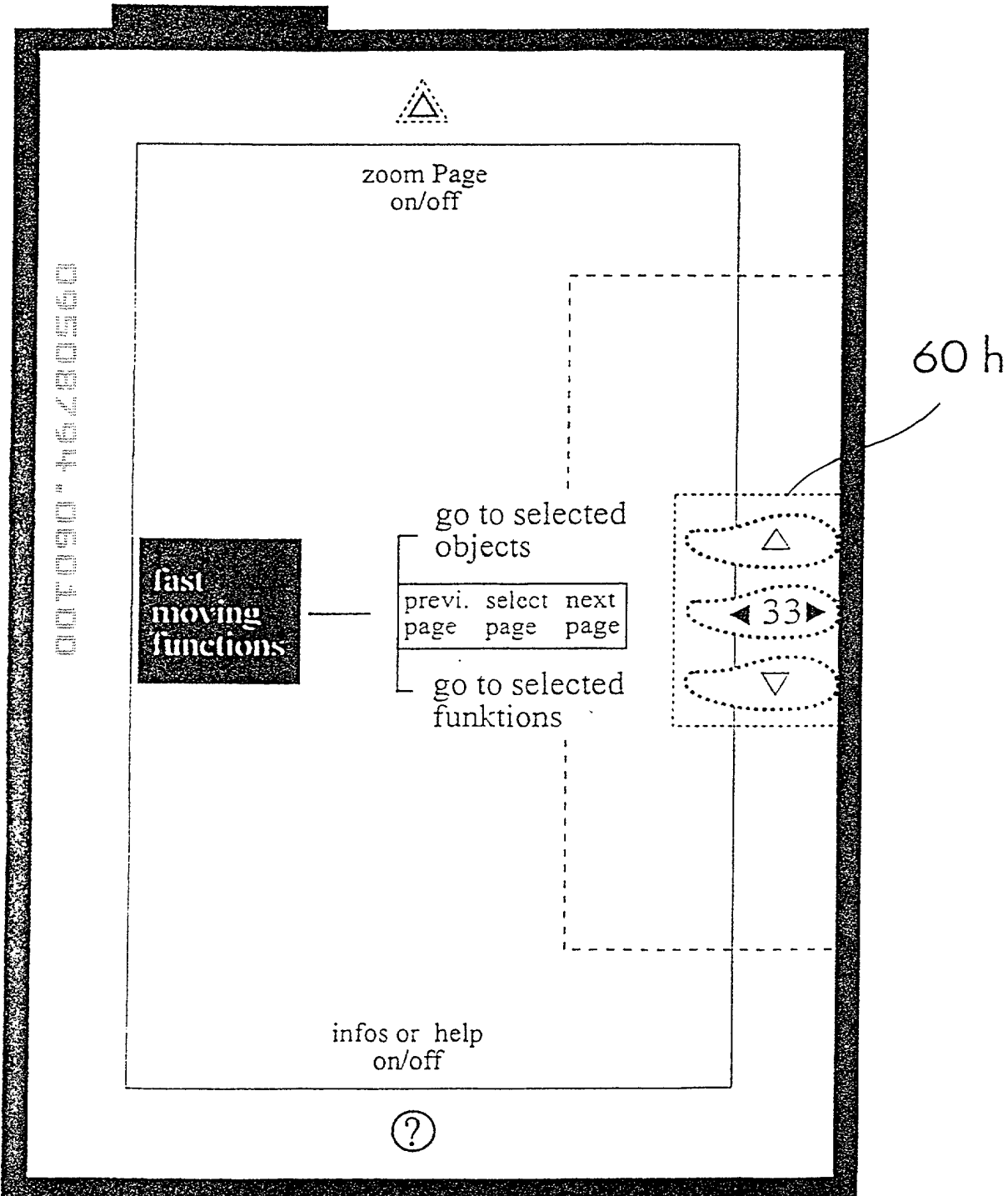


FIG 17d



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FIG 18a



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FIG 18b

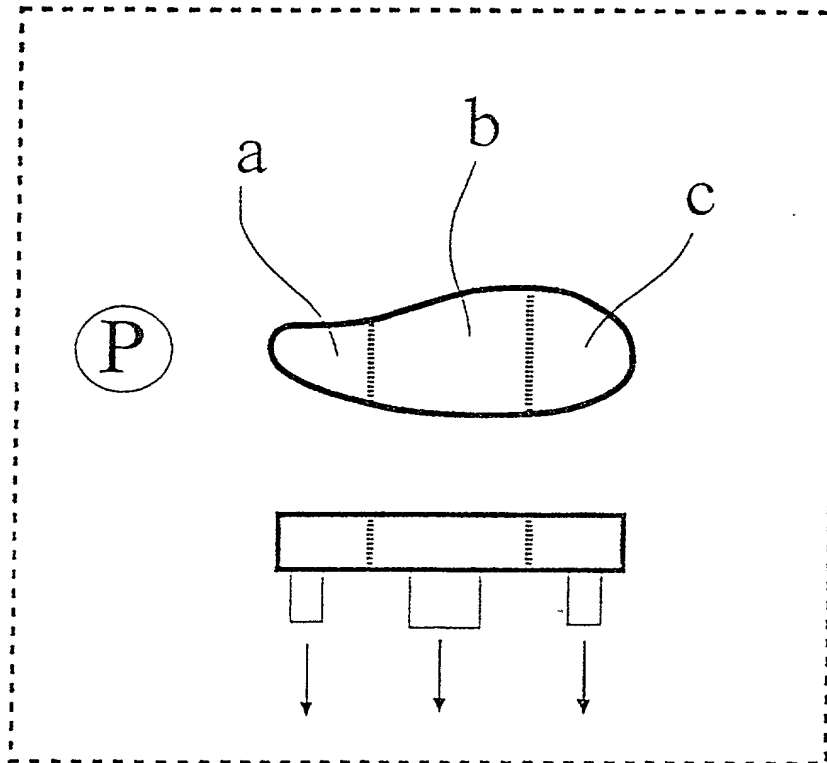




FIG 18c

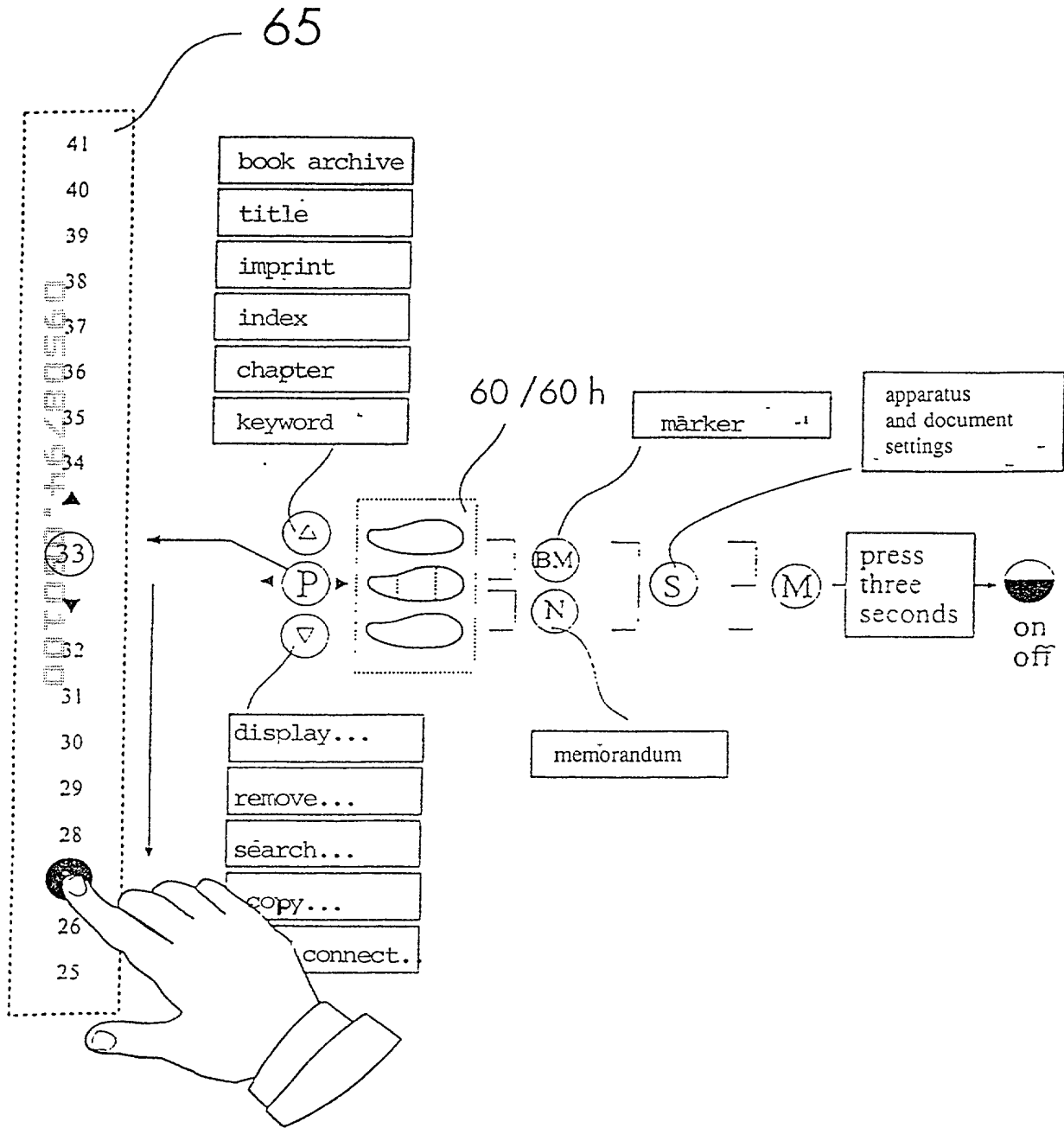
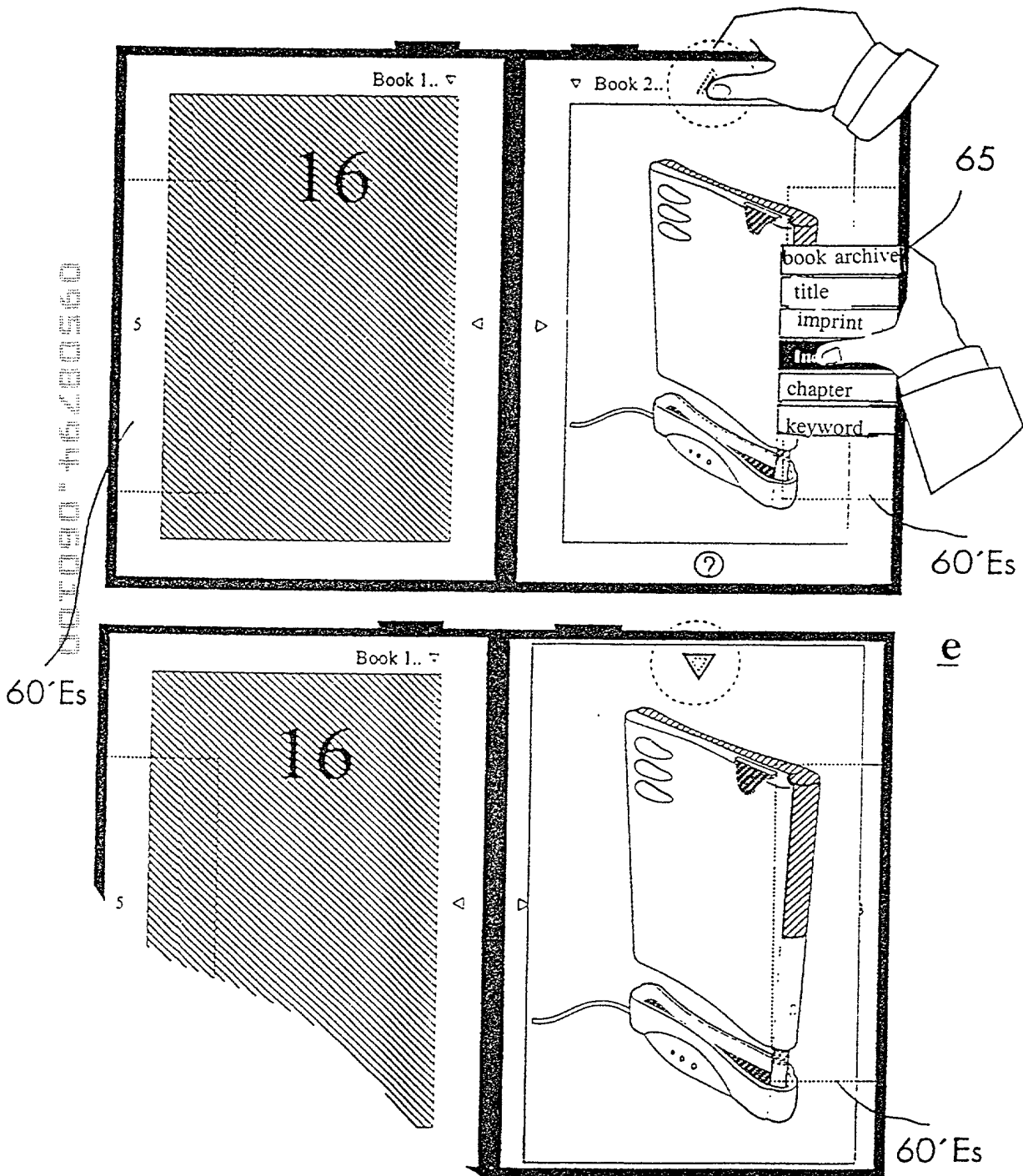


FIG 18d



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FIG 19a

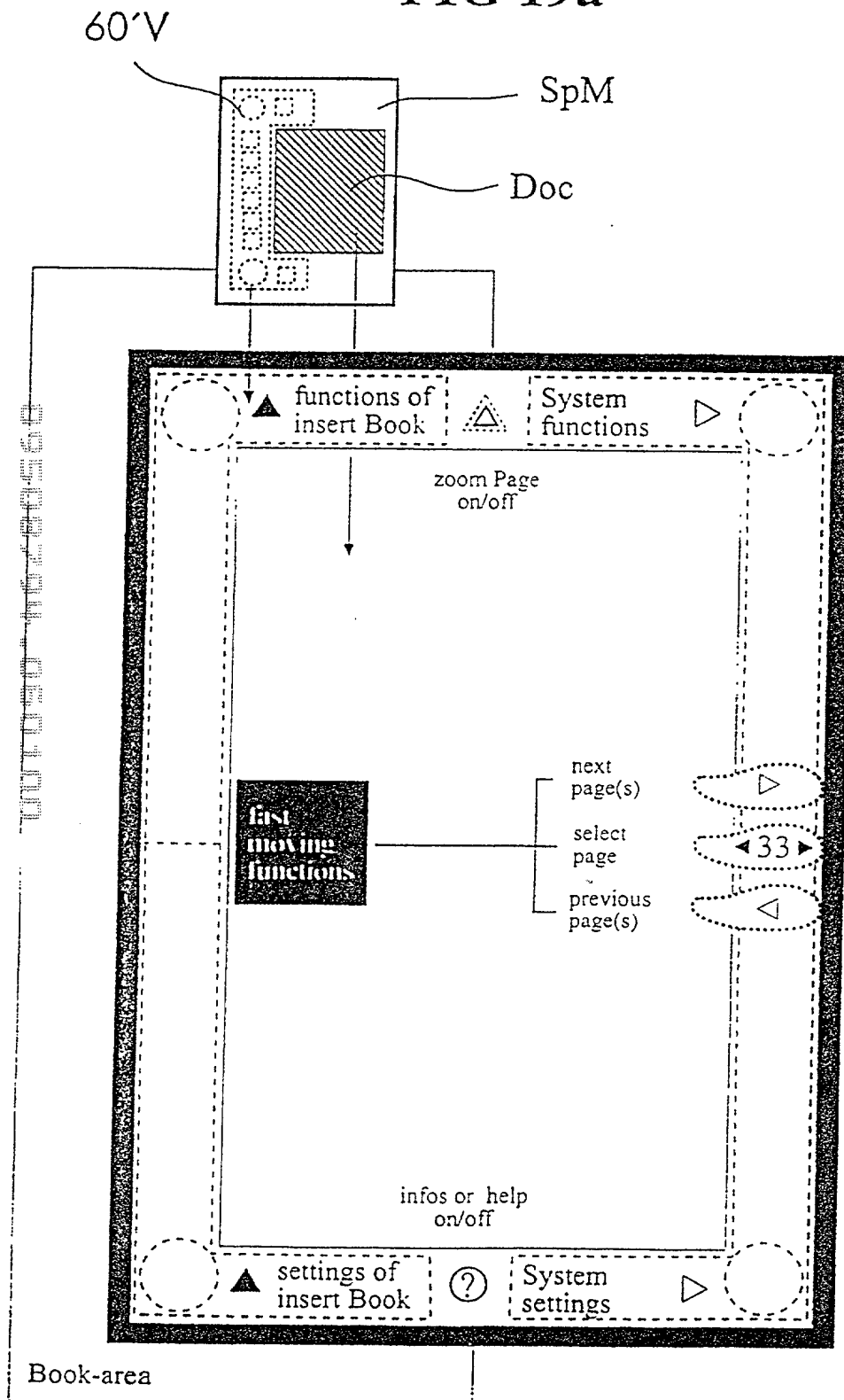
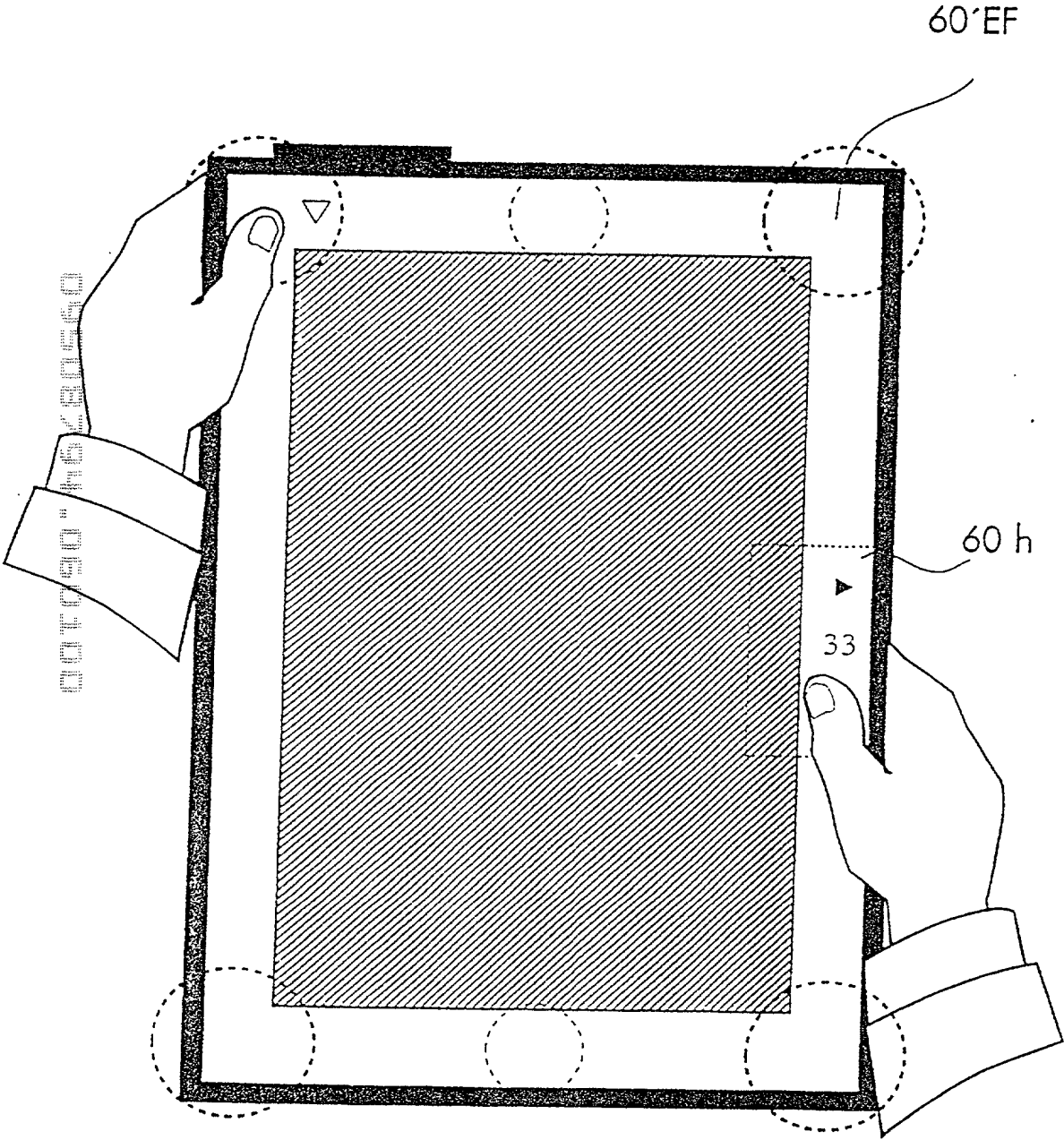
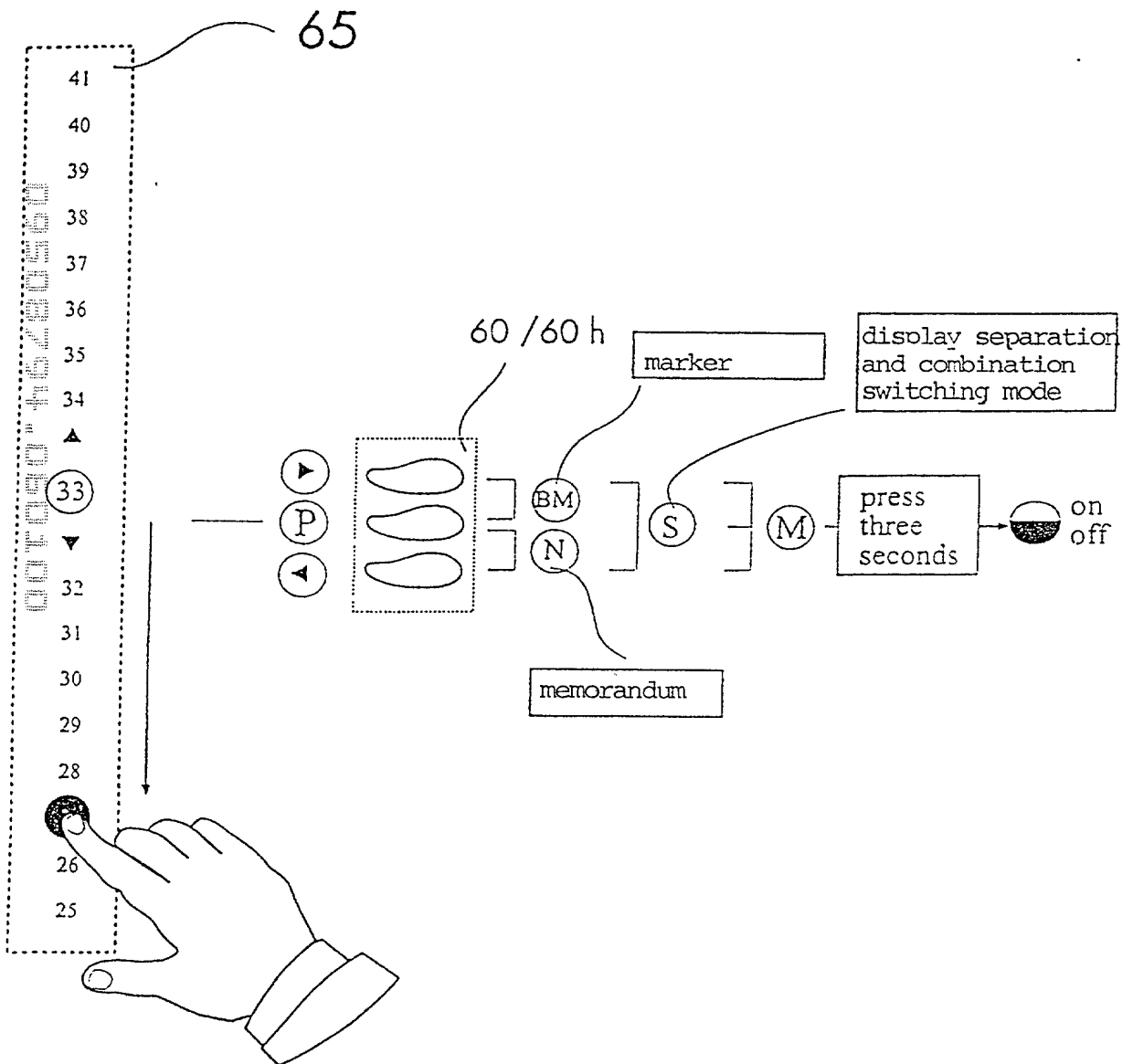


FIG 19b



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FIG 19c



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FIG 20

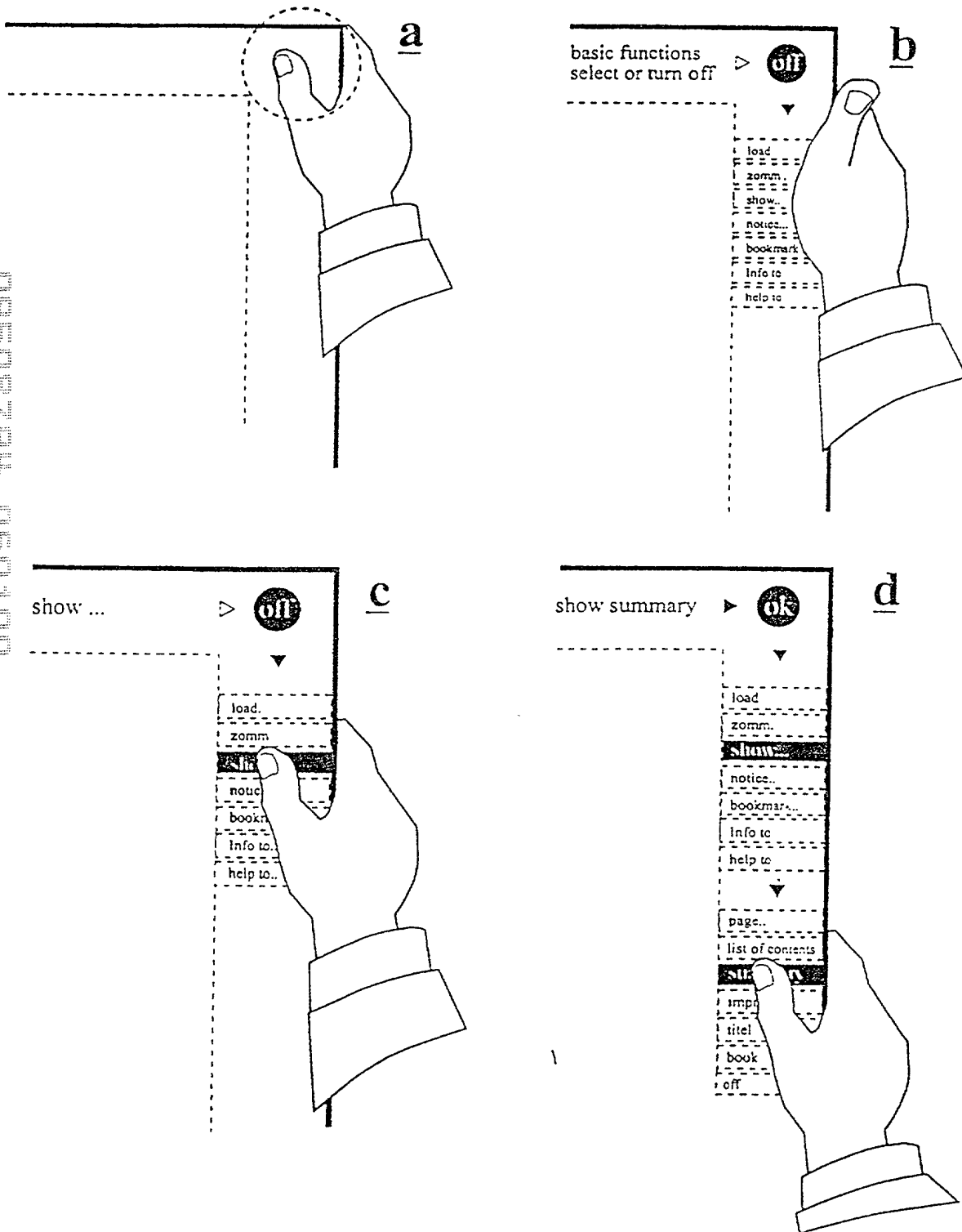
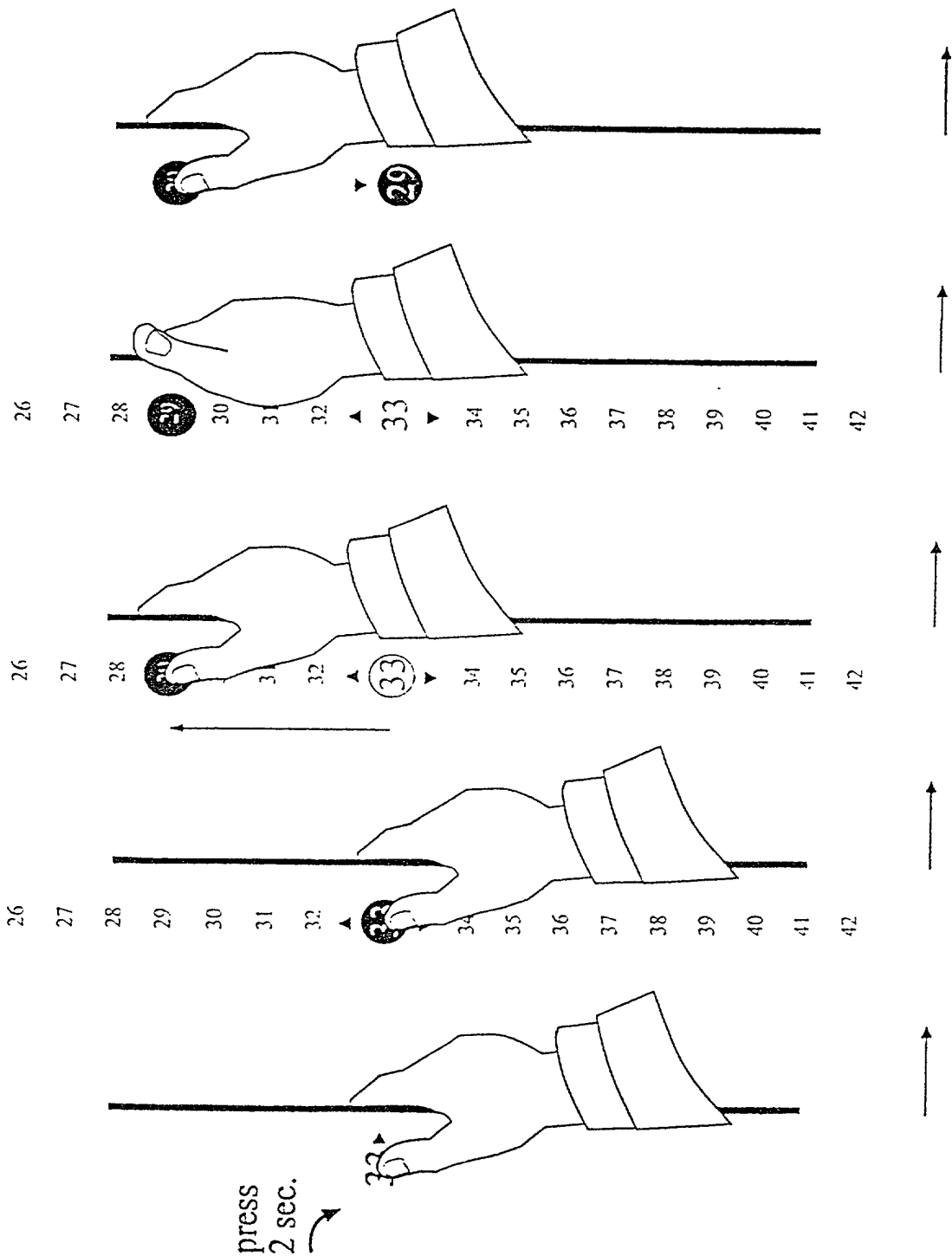


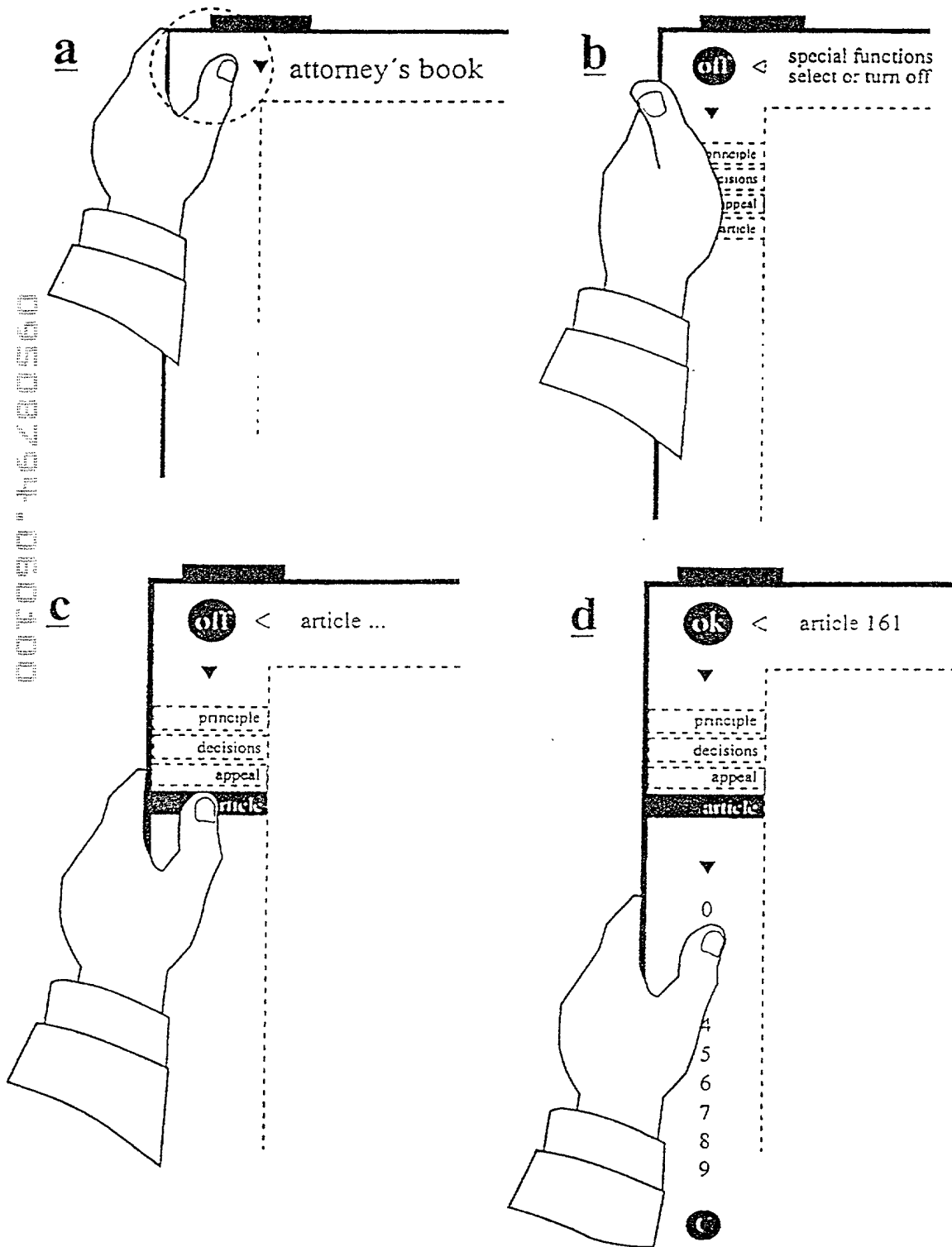
FIG 20e

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FIG 21





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FIG 21

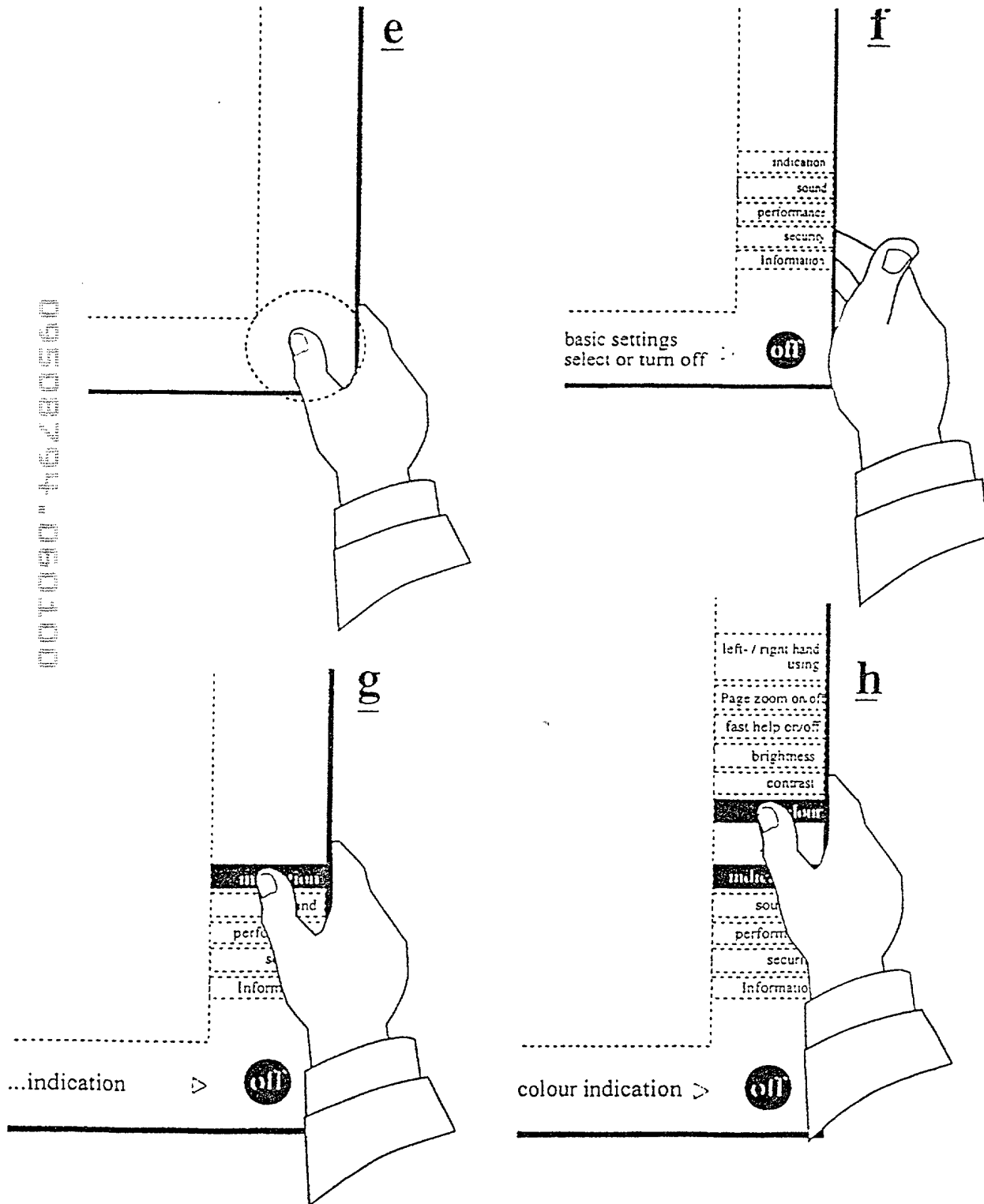
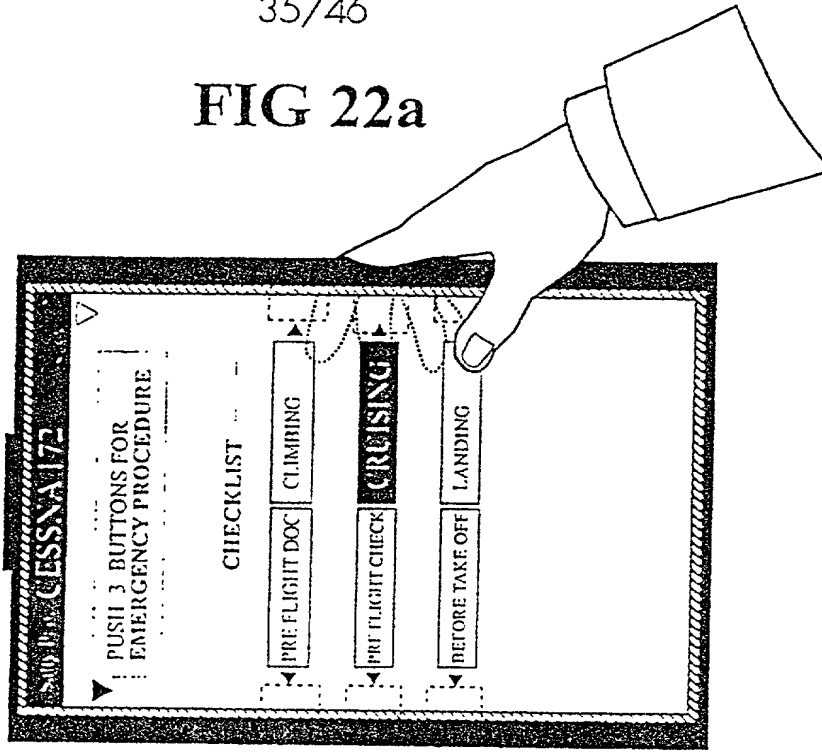
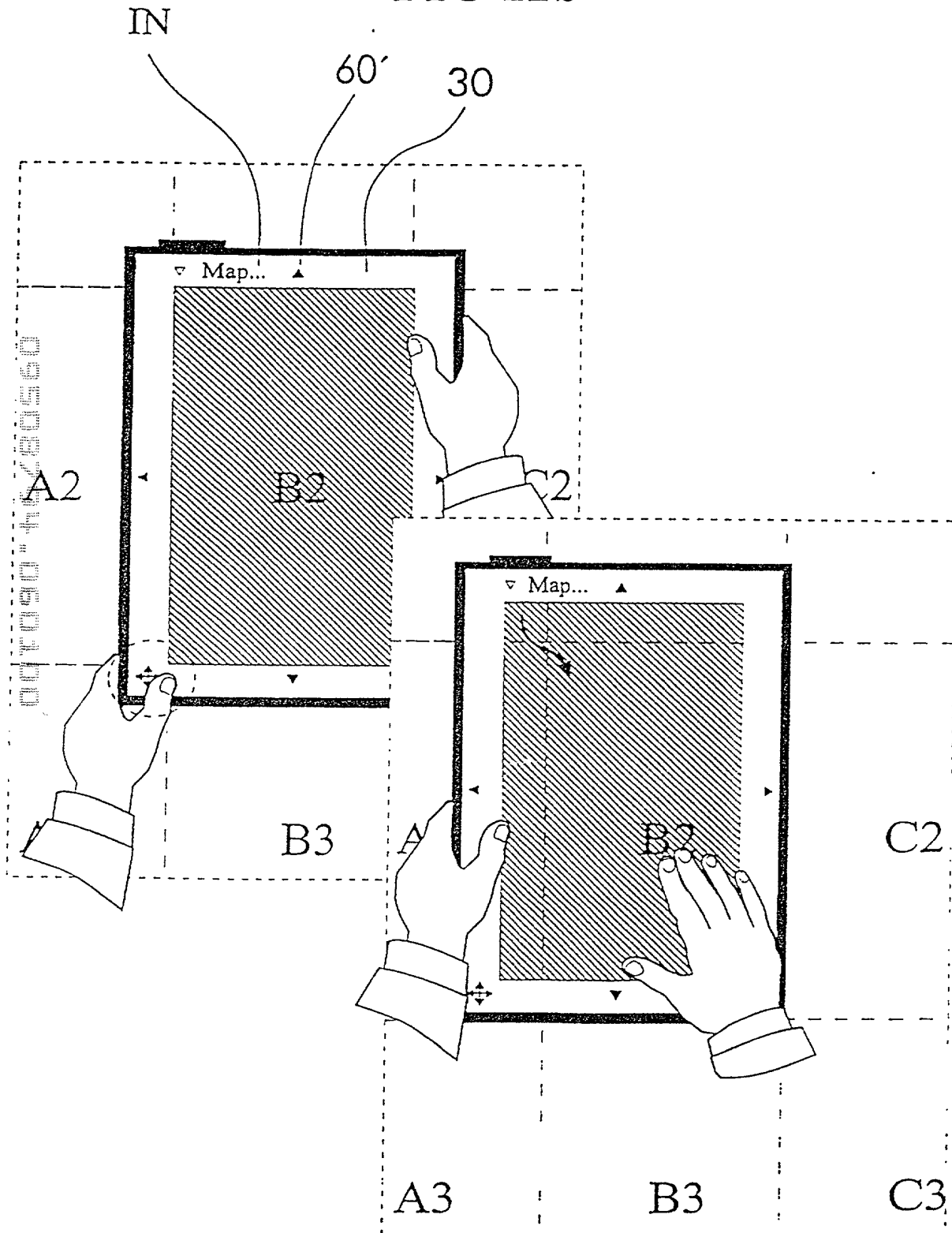


FIG 22a





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FIG 22c

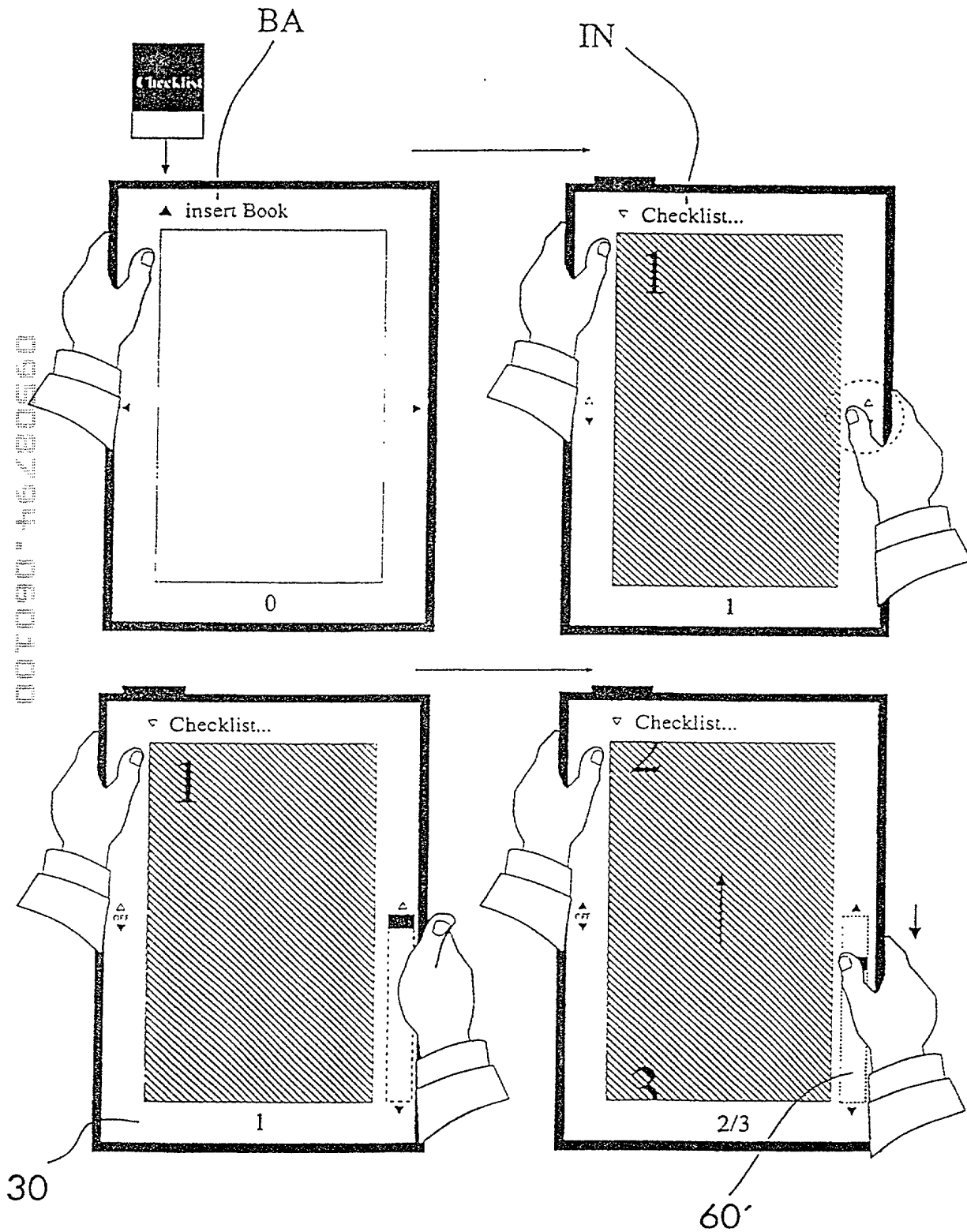


FIG 23

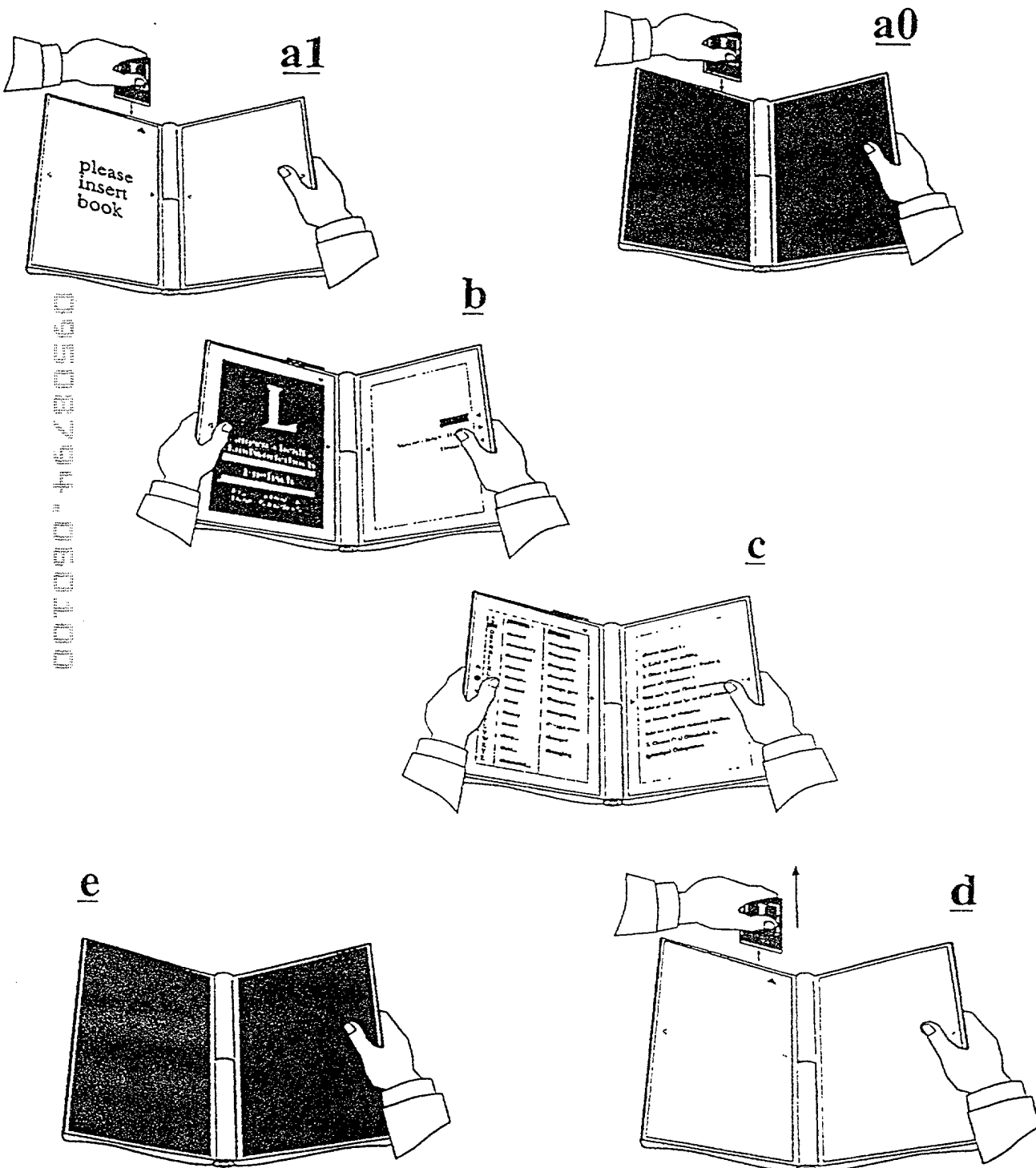
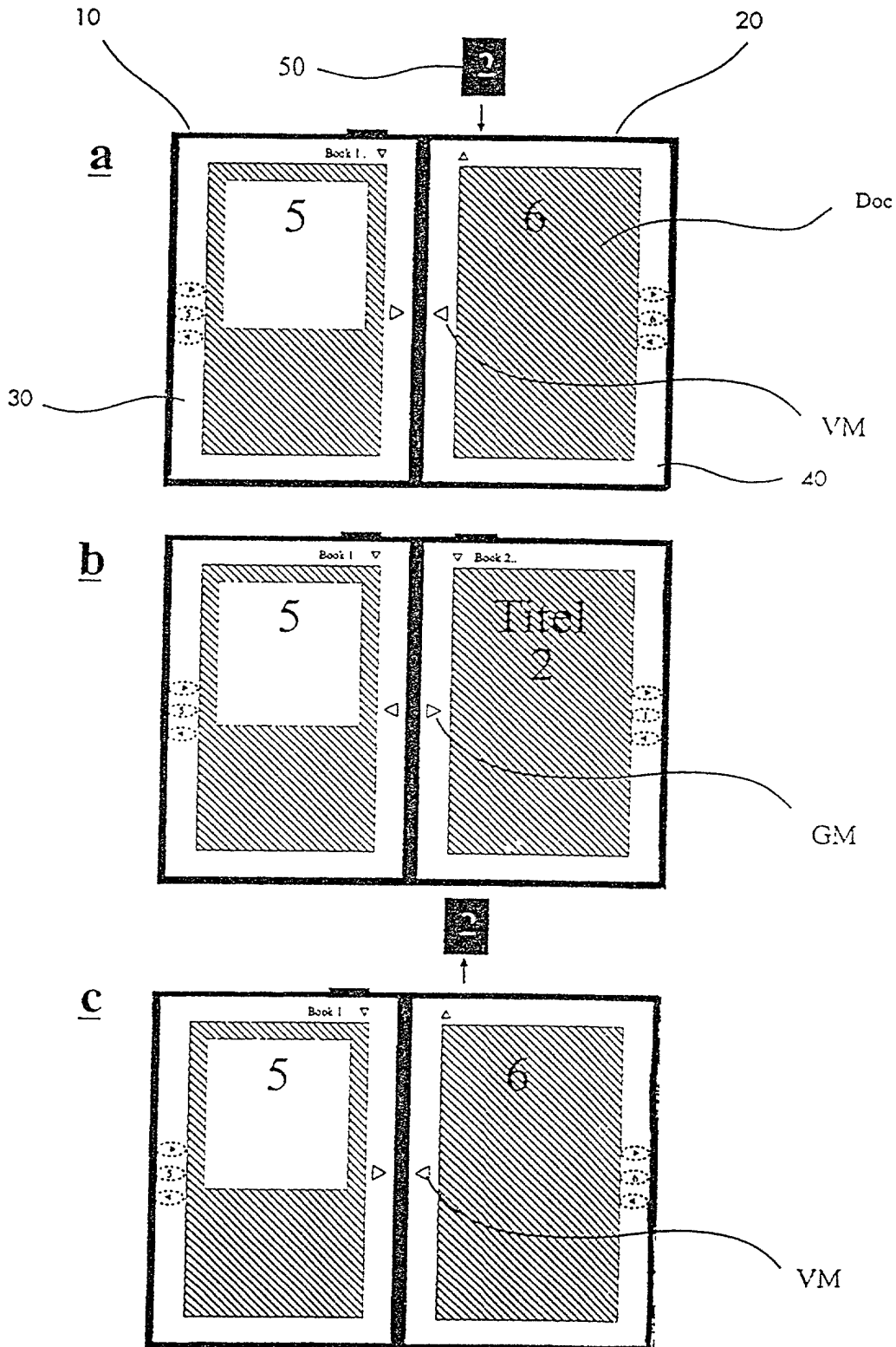
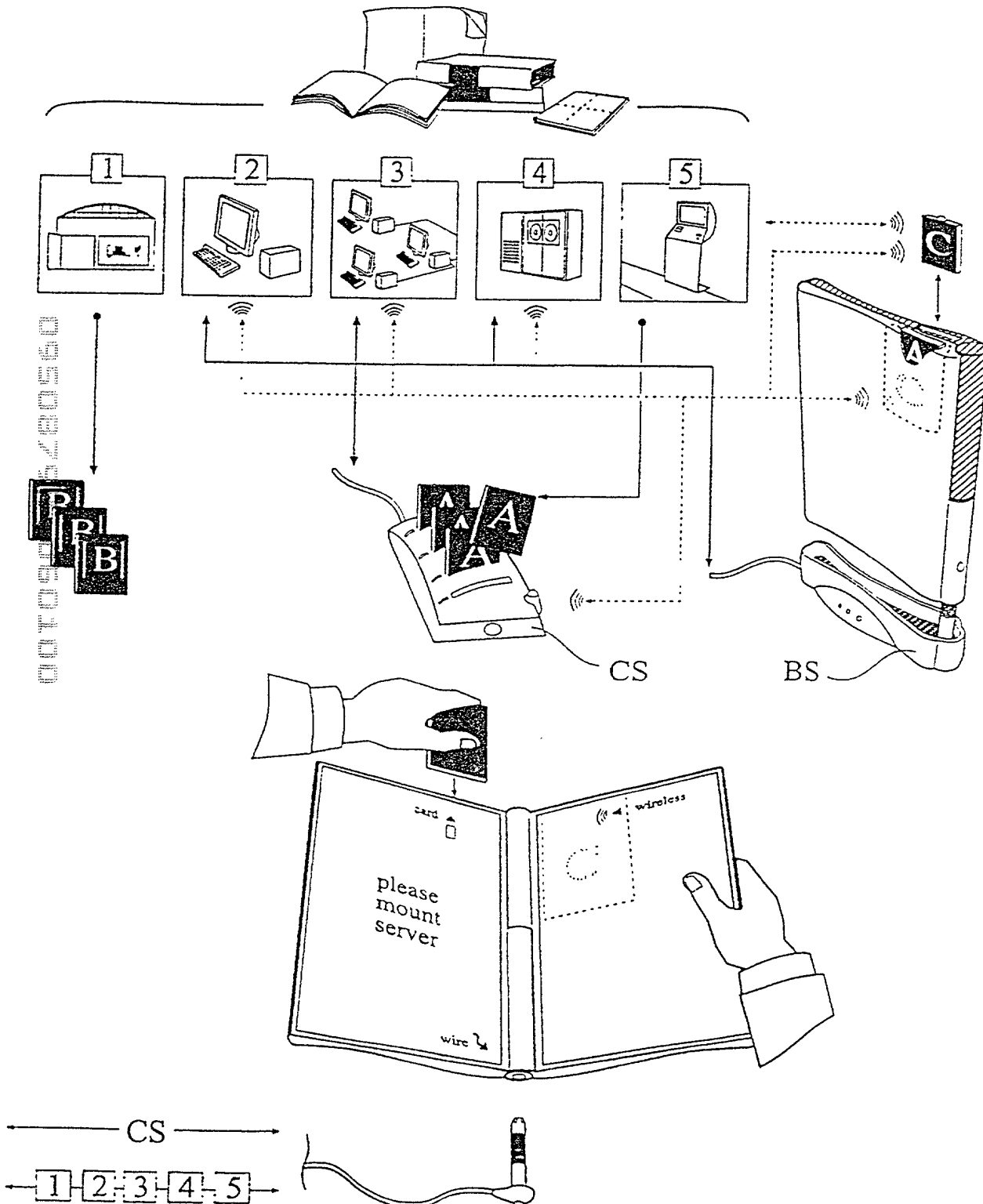


FIG 24



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FIG 25

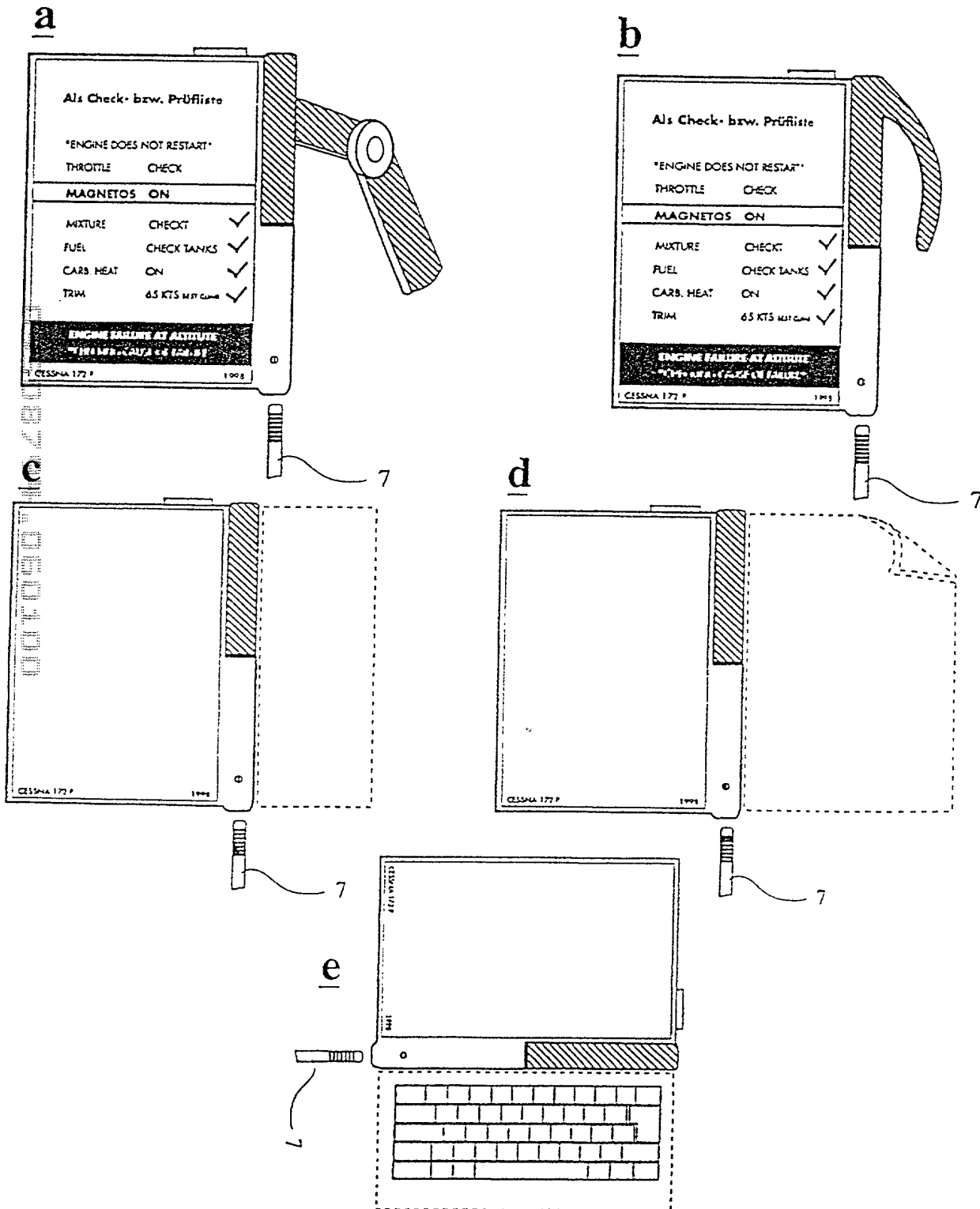






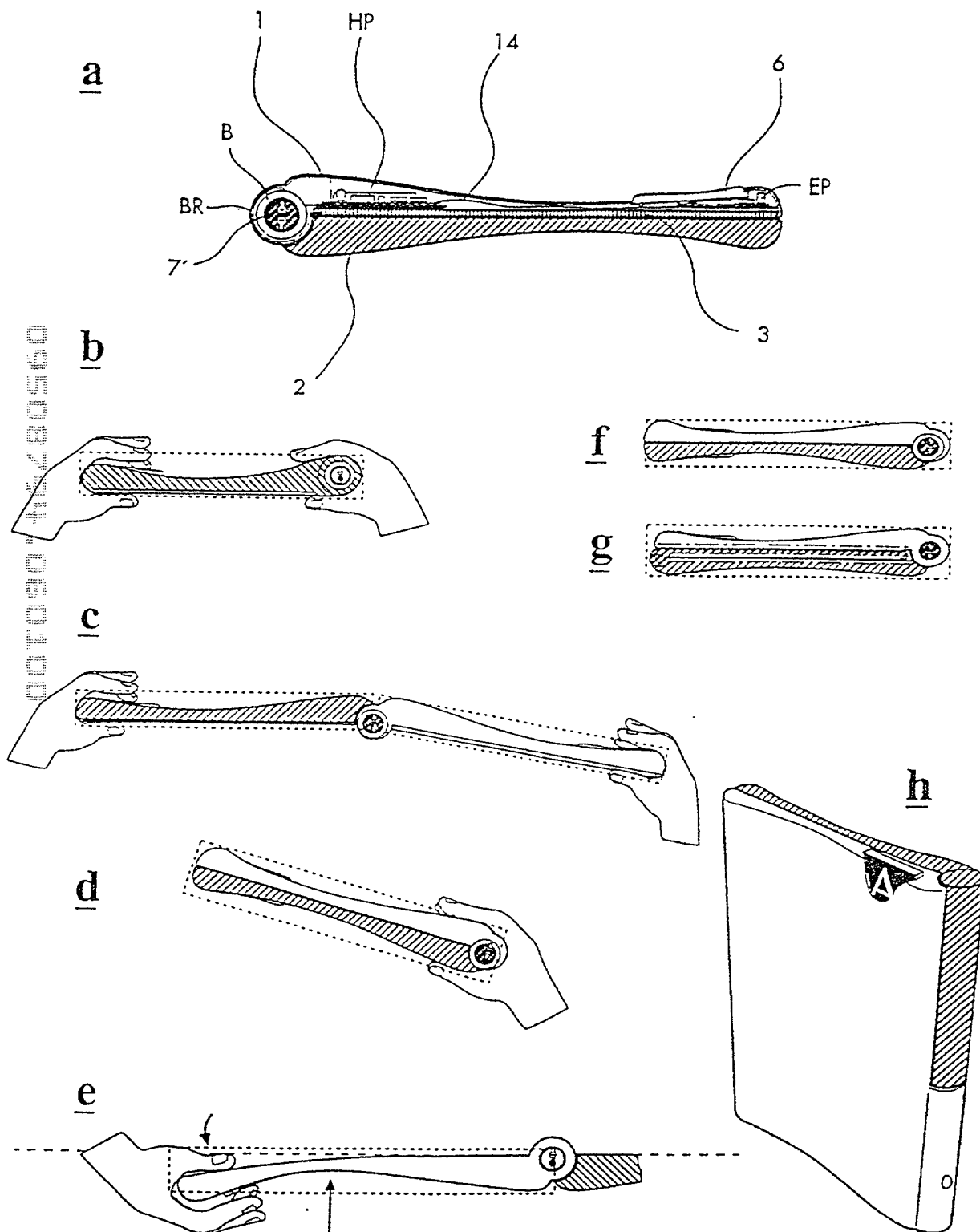
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FIG 26a

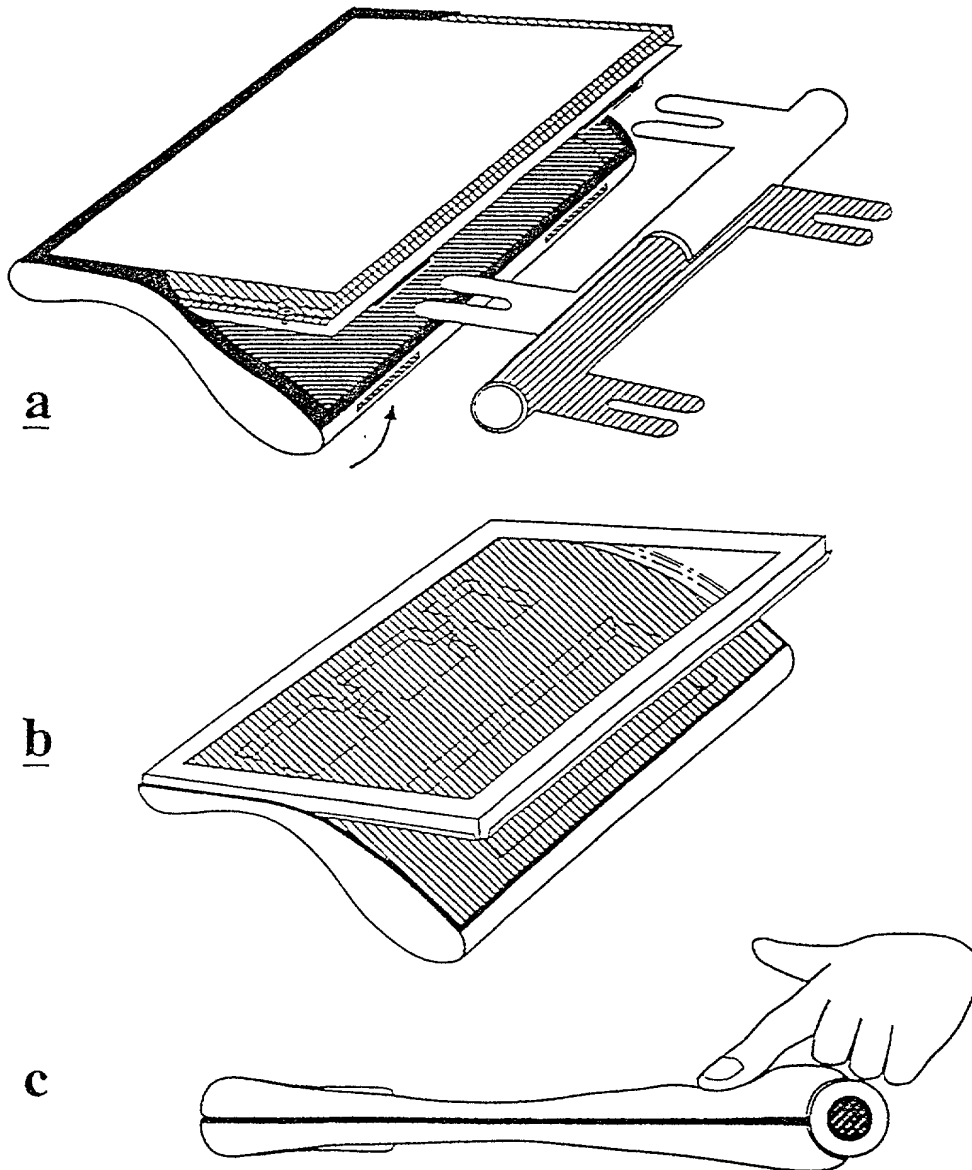


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FIG 27



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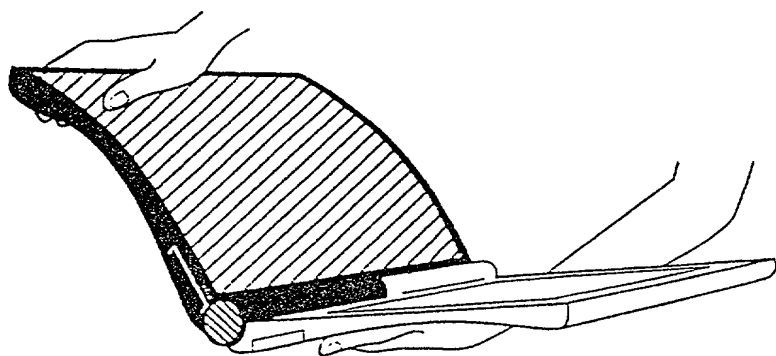
**FIG 28**

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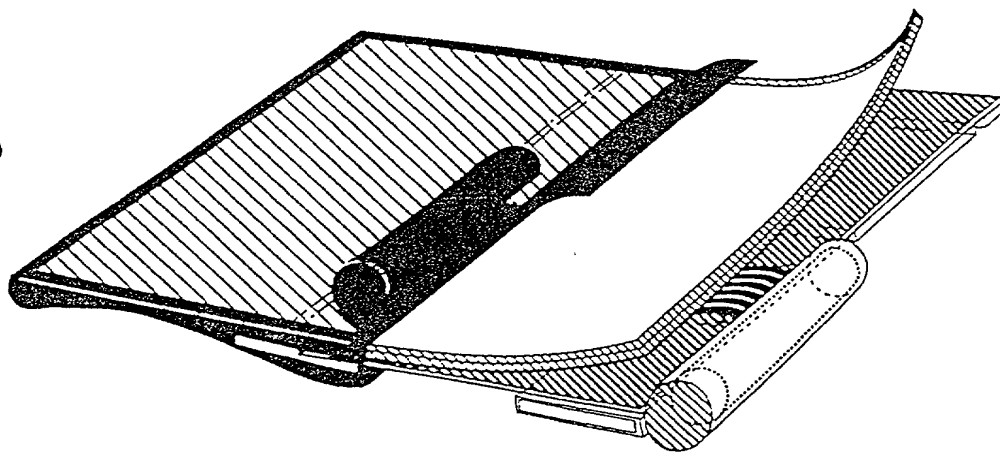
FIG 29

09/508794-06200560

a



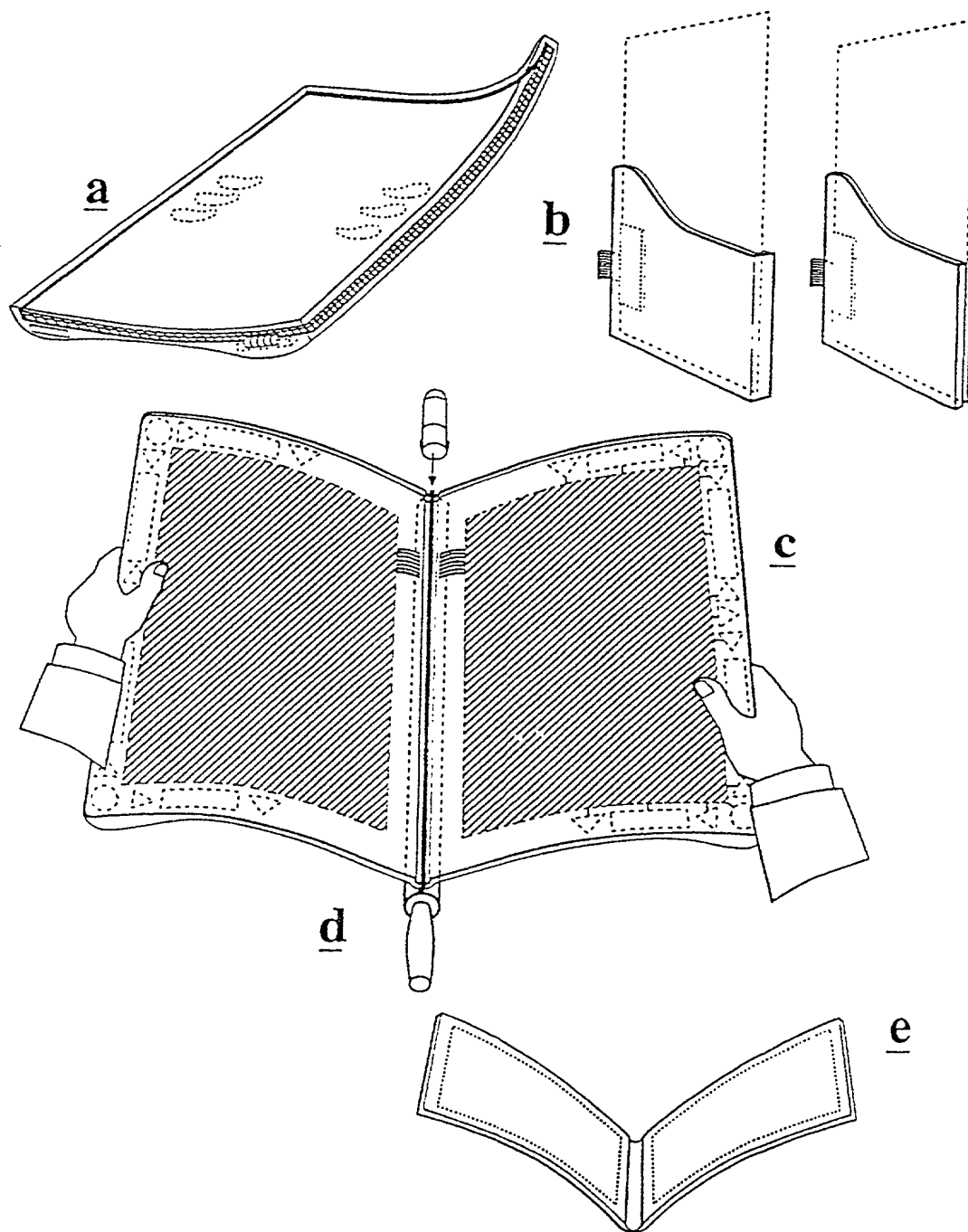
b



c



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**FIG 30**

65705-002

10 Rec'd PCT/PTO 01 JUN 2000

# Declaration and Power of Attorney for Patent Application

## Erklärung für Patentanmeldungen mit Vollmacht

### German Language Declaration

Als nachstehend benannter Erfinder erkläre ich hiermit an Eides Statt:

As a below named inventor, I hereby declare that:

daß mein Wohnsitz, meine Postanschrift und meine Staatsangehörigkeit den im nachstehenden nach meinem Namen aufgeführten Angaben entsprechen, daß ich nach bestem Wissen der ursprüngliche, erste und alleinige Erfinder (falls nachstehend nur ein Name angegeben ist) oder ein ursprünglicher, erster und Miterfinder (falls nachstehend mehrere Namen aufgeführt sind) des Gegenstandes bin, für den dieser Antrag gestellt wird und für den ein Patent für die Erfindung mit folgendem Titel beantragt wird:

My residence, post office address and citizenship are as stated next to my name.

I believe I am the original, first and sole inventor (if only one name is listed below) or an original, first and joint inventor (if plural names are listed below) of the subject matter which is claimed and for which a patent is sought on the invention entitled

### Digital Book

the specification of which is attached hereto unless the following box is checked:



was filed on **September 21, 1998**  
as United States Application Number or PCT  
International Application Number **PCT/EP98/06008**

deren Beschreibung hier beigefügt ist, es sei denn (in diesem Falle Zutreffendes bitte ankreuzen), diese Erfindung

☒ wurde angemeldet am  
unter der US-Anmeldenummer oder unter der  
Internationalen Anmeldenummer im Rahmen des  
Vertrags über die Zusammenarbeit auf dem Gebiet  
des Patentwesens (PCT).

Ich bestätige hiermit, daß ich den Inhalt der oben angegebenen Patentanmeldung, einschließlich der Ansprüche, die durch einen oben erwähnten Zusatzantrag und in einem "preliminary amendment" abgeändert wurden, durchgesehen und verstanden habe.

I hereby state that I have reviewed and understand the contents of the above identified specification, including the claims, as amended by any amendment referred to above and as amended in a preliminary amendment.

Ich erkenne meine Pflicht zur Offenbarung jeglicher Informationen an, die eventuell zur Prüfung der Patentfähigkeit in Einklang mit Titel 37, Code of Federal Regulations, § 1.56 von Belang sind.

I acknowledge the duty to disclose information which is material to patentability as defined in Title 37, Code of Federal Regulations, § 1.56.

[Page 1 of 3]

Burden Hour Statement: This form is estimated to take 0.4 hours to complete. Time will vary depending upon the needs of the individual case. Any comments on the amount of time you are required to complete this form should be sent to the Chief Information Officer, Patent and Trademark Office, Washington, DC 20231. DO NOT SEND FEES OR COMPLETED FORMS TO THIS ADDRESS. SEND TO: Commissioner of Patents and Trademarks, Washington, DC 20231.

## German Language Declaration

Ich beanspruche hiermit ausländische Prioritätsvorteile gemäß Title 35, US-Code, § 119 (a)-(d), bzw. § 365(b) aller unten aufgeführten Auslandsanmeldungen für Patente oder Erfinderurkunden, oder §365(a) aller PCT internationalen Anmeldungen, welche wenigstens ein Land ausser den Vereinigten Staaten von Amerika benennen, und habe nachstehend durch ankreuzen sämtliche Auslandsanmeldungen für Patente bzw. Erfinderurkunden oder PCT internationale Anmeldungen angegeben, deren Anmeldetag dem der Anmeldung, für welche Priorität beansprucht wird, vorangeht.

I hereby claim foreign priority under Title 35, United States Code, §119(a)-(d) or § 365(b) of any foreign application(s) for patent or inventor's certificate, or § 365(a) of any PCT International application which designated at least one country other than the United States, listed below and have also identified below, by checking the box, any foreign application for patent or inventor's certificate, or PCT International application having a filing date before that of the application on which priority is claimed.

Prior Foreign Applications  
(Frühere ausländische Anmeldungen)

Priority Not Claimed  
Priorität nicht beansprucht

197 414 53.2                      Germany

19/September/1997

☐

Number                      Country

Day/Month/Year Filed

☐

Ich beanspruche hiermit Prioritätsvorteile unter Title 35, US-Code, § 119(e) aller US-Hilfsanmeldungen wie unten aufgezählt.

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**German Language Declaration**

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